THE ONLY MAGAZINE DEVOTED EXCLUSIVELY TO ORGANIC GARDENING

Organic Gardening

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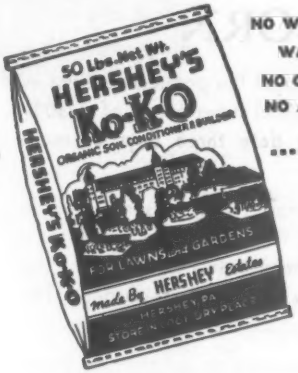

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HERSHEY ESTATES
HERSHEY, PENNSYLVANIA

WINTER GARDEN

November 19, 1947.

Dear Sirs:

In your November issue, (page 47, last paragraph), I note the statement that lettuce, radishes (in hotbeds!!), asparagus, rhubarb and cabbage, are the only vegetables recommended for November planting in the South.

Believe it or not, as Ripley would say, I have for a number of years brought more than a score of vegetables through each winter, here in Raleigh, which is near the northern limit of the Cotton Belt, and that without the use of coldframe, hotbed or greenhouse.

In 1937 I moved to a home built on the edge of an eroded cotton field that required no little effort to bring to suitable tilth. Nevertheless, during this time 26 or 28 kinds of vegetables have weathered our winters. In this period only one planting of lettuce of about 25 vegetables planted was damaged. Of course successive plantings of nearly all kinds were used in the 10-year demonstration.

I would remind your subscribers in the Cotton Belt who desire to have a winter garden, that it must be started before winter comes—long before frost, and long before *freezing*, and that successive plantings of some 18 to 24 kinds must be made at the right intervals, to insure a continuous supply from the time of the first fall freeze on to the time of the last freeze in the spring.

In my fifty years of experience in vegetable gardening, I have found there are so many variations recommended for planting dates, that the would-be *winter gardener* in the South is confused and discouraged because most of the advisers on the subject

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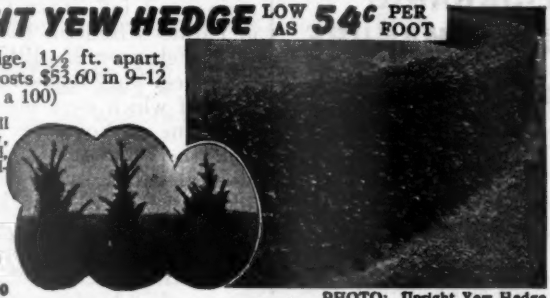

PHOTO: Upright Yew Hedge 10 years after planting 15-18" size (inset).

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Fine Young Plants, 12 in. High. Slender now, but will grow bushy. Small Ball of Earth. Not Prepaid. Pay express (about 6c a plant) on arrival.

50 **RHODODENDRON, Maximum;** white in July ..... for $17.50	5 each kind 20 plants	
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50 **KALMIA (Mountain Laurel);** pink-white in June ..... for $20.00		$47.50

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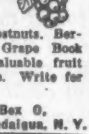

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overlook isothermal lines with their vital import.

Though I have never seen the statement made, I am quite sure that the U. S. Weather Bureau will agree with me when I say that the upper Cotton Belt has 4 months of winter, 4 months of summer, and two months each of spring and fall. (See Climate zones in Farmer's Bulletin 1673, U.S.D.A.).

On February 22, 1947, my garden contained the following vegetables, some of which were planted in April, '46, some in November of that year, and others between these dates: beet, broccoli, carrot, celery, chard, collard, dandelion, endive, kale, kohlrabi, leek, lettuce, onion, parsley, parsnip, radish, rutabaga, salsify, spinach and turnip (not turnip greens), all grown in the open, and all hardy in the Cotton Belt.

C. L. Newman,
1618 Oberlin Road,
Raleigh, N. C.

—o—

FARM MANAGER ON DEPLETED SOILS

November 18, 1947.

Gentlemen:

I am a farm manager and have been for over 30 years on a good producing farm in southeast Iowa. I have become convinced that our failure to produce good red clover seed in the past few years and thus forcing the price up to $40.00 per bushel, and to raise hogs that will not show signs of malnutrition while hogging down corn (hybrid) amounts to acknowledgement of depleted soils. Bumble bees are vital to good clover growing. Boron has been said to produce 600 pounds of clover seed to the acre, but it surely will not produce bumble bees. They're scarce, almost extinct out our way.

I am convinced that organic farming is the answer to many of our soil-rebuilding problems, but is brome grass and alfalfa the answer? Who knows how much manure is necessary and what kind will produce the desired compost heap for 40-acre plots?

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the earth's electricity? This combined with the sunrays make plants grow. Which minerals are best for this? This is my own idea. Why wouldn't the needed heat for compost be produced by an electric current?

Lack of cultivation of gardens to discourage weeds will not add the oxygen a plant needs. The earth needs to be stirred to admit oxygen.

I am sure that too much commercial fertilizer and poison sprays to kill weeds will cause a backset of greater magnitude than the weeds themselves. We cannot afford to experiment with our land in Iowa—that is why I became interested in organic gardening.

Paul F. Jones,
2500 Park Lane,
Glenview, Illinois.

—o—

A COFFEE GRINDER FOR LEAVES

November 20, 1947.

Dear Sirs:

Yesterday an old friend called on me to see if I didn't have an abandoned coffee mill that could be used for grinding the leaves from six oak trees in his home yard, so that they would disintegrate faster in his compost pit. Although he had no animal matter to add to his leaves and lawn clippings, the "compost" greatly improved his flowers and fruit trees. He was a subscriber to *Organic Gardening* and read it regularly.

I had never heard of that paper, I told him, but I had a little book, *Pay Dirt*, which I would lend him. The story ends happily with our finding that we were disciples of the same master.

Along with a bill from some New York seed house, I found a little folder describing the book and I ordered a copy. I was so impressed that I ordered six more copies, telling myself that, if they did nothing more than bring improvement to the home garden of even one of my West Texas tenant farmers, I would feel repaid. Thus far, I am still in the hole. Ben Franklin

wrote his friend that it is difficult, if not impossible, to change farmers from the methods of their ancestors; and he was pretty generally right.

Having read in Texas papers of the marvels of Hubam Clover as a cover and green-manure crop, I wrote to the Experiment Station nearest to the area of my farms to ask if, from their experience, they could recommend the planting of the clover in preference to complete summer-fallowing. I told them that on one of the places I was not hampered by crop-sharing and could order things as I pleased.

The Superintendent wrote a very good answer, saying that it might be well to experiment with 10 or 15 acres; that, as for summer-fallowing, it had but one point of value—the conservation of moisture. He said that, if at seed time, the soil was already full of

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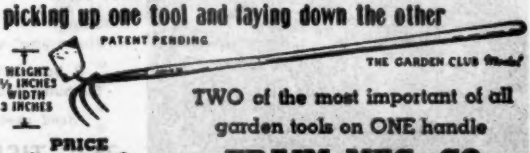

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SOIL RESEARCH LABORATORIES, INCORPORATED

P. O. Box 736 Youngstown, Ohio

moisture, there was no use to try to put more into it.

That piece of advice has paid off well this year. When drought forced summer-fallowing on them, the tenants were so impressed with its benefits that they had consented to plant or sow only two-thirds of their fields on a three-year rotating basis. They believed that over the years they would have greater returns, with smaller outlay for labor and seed.

But the fall of 1946 was very wet and the plan for leaving out the one-third was given up, with the result that full acreages were sown of winter wheat which gave good yields at high prices. Again, in May of this year, down-pours which in some instances damaged the wheat gave deep moisture enough to bring cotton and grain sorghums through to bountiful harvests, although there was literally no rain during the growing season.

It seems certain that, in that country of 22 to 23 inches average annual rain-fall, deep moisture at seed time is the thing—is of far greater importance than what may fall on the growing crops.

The Experiment Station Superintendent had written me in regard to the Hubam that, on the average good land in my area, moisture was the only

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Enjoy these gorgeous white fragrant blooms in June and July, outside.

We will ship, prepaid, to any part of the U. S. our, choice, organically grown, big, blooming size bulbs.

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by Dr. Thomas J. Barrett

Published by Bruce Humphries, Inc., Boston— and Ryerson Press, Toronto, Canada

The Author, Dr. Thomas J. Barrett, well-known authority on intensive propagation and use of earthworms, exhibits giant parsnip and carrot . . . perfectly crisp and tender . . . grown in experimental gardens at "Earthmaster Farms." Dr. Barrett, a former physician and editor, has devoted 12 years to research and practical earthworm farming. He has contributed articles on this subject to Magazine Digest, Organic Gardening, Encyclopedia Brittanica Jr. and many other publications.

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- Intensive Earthworm Culture— in Boxes—in Culture Beds
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An exciting and important book that tells the "why" and "how" of organic soil-building through nature's richest humus factory, the Earthworm. If you till the soil . . . whether it's a flower bed, vegetable garden, orchard or farm . . . you'll enjoy and profit by this amazing and practical book on intensive earthworm culture. The first comprehensive coverage of this important subject in a fully-illustrated library edition. 1000 copies reserved by author for personal distribution.

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AND OTHER
Sub Zero Hybrid Teas

Vigorous. — Beautiful. — Easy to grow. — Large abundant blooms, more constantly. — Comparable with the best.

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Special Collection
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limiting factor; and the well-done bulletin he sent me dwelt only on methods of conserving moisture. He may be right so far as the present generation is concerned; but, of course, the time will come when the lands will wear out.

I sent him a copy of *Pay Dirt*, telling him that, writing from a well-watered country, you had concerned yourself only with organic matter; that, by contrast, his excellent bulletin had casually mentioned organic matter as something to be studied in connection with moisture conservation.

He did not acknowledge my letter or the book, and I have missed him on the two occasions when I visited him. I hope that I may have given him "something to be studied in connection with" his single-track research. But, as Franklin said, farmers are hard to change over.

H. M. Houston,
P. O. Box 1136,
Austin, Texas.

—o—

EASILY CONVERTED

January 4, 1948.

Dear Sirs:

After discovering your magazine and visiting the garden of another organic gardener, I was an easy convert to your way of thinking.

Robert J. Davis,
92 State St.,
West Englewood, N. J.

—o—

"GIFT FROM HEAVEN"

December 29, 1947.

Dear Sirs:

I have read and studied your magazine *Organic Gardening* and it has seemed like a "Gift from Heaven" and

FOR THE **JOY** OF ORGANIC GARDENING

Activo makes rich, activated compost-fertilizer quicker, better, easier, cheaper from waste . . . leaves, garbage, etc. . . . (reduces garbage without odor!) . . . Activates, conditions and sweetens soils . . . Stretches and improves chemical fertilizer. Many other uses. Organic, Bacterial, Odorless. At dealers. Or, trial size for 1700-lb. compost, $2.00, postpaid.

Benson-Maclean, Bridgeton 14, Indiana

is just that to any farmer who will read it. I have traveled around the world a few times and have carefully watched wherever I went the methods used in farming and gardening. I studied the methods in Europe, South America, Egypt and the rest of Africa, and many islands, and can see where organic farming and gardening cannot have a rival. I was reared on a good farm in Pennsylvania and now have 118 acres of cleared land and woodland.

Perry E. Rankin,
Box 226,
Princess Anne, Maryland.

—o—

DOES AND DOES NOT AGREE WITH O. G.

Aug. 11, 1947

I have written to Senator Ives to express my feelings in regard to the expansion of the government's chemical fertilizer facilities.

However, I am totally opposed to

72

NORTH AMERICAN BIRD SONGS ON SIX VINYLITE RECORDS

Brought to your phonograph as recorded in native wilds.

Made in the birds' natural haunts by the Albert R. Brand Bird Song Foundation, Laboratory of Ornithology, Cornell University.

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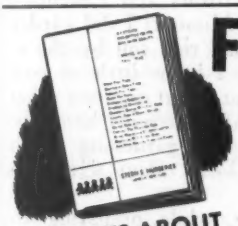

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- Golden Muscat Grapes
- Everbearing Raspberries
- Everbearing Strawberries
- Blueberries with fruit buds
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- Everblooming Roses
- European Linden
- Magnolias with flower buds
- Festival, new thornless Rose

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New guide to glorious fruits & flowers

Just off the press. Chock full of helpful information. Every page illustrated in true-to-life natural color photography.

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Grow GLADIOLUS FROM SEEDS!

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Amazing yields from these big, sweet, juicy peaches for home or orchard; hardy; early bearing.

OUR NEW 5-N-1 Peach—five varieties of peaches budded in one peach tree gives you fruit from early June until late October from the one tree. Also our 5-N-1 Apple with five varieties of Apples on one tree ranging from early Summer to your late Winter Apples.

We also offer a limited number of four and five year old Super bearing age: Apple, Peach, Cherry, Pear and Apricot. Save years of labor and cultivation by planting bearing age trees!

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EGYPTIAN NURSERY CO.
Dept. OG Farina, Ill.

your suggestion that the government control crop plantings. I am convinced that this would lead to the same chaos that results from all government interference.

A *free economy* would solve this problem. The operation of economic forces, if free, would accomplish the desired results, far better than the planning of the experts.

Please remember that we have never had a truly free economy or real competition thru-out economic life.

E. J. Beckert Jr.,
356 Riverdale Ave.,
Yonkers 5, N. Y.

—o—

AN ARIZONA READER

April 18, 1947.

Gentlemen:

There is quite a story leading up to my subscription to your magazine and here it is.

I came to Arizona and Phoenix in 1941. Back in Missouri I did gardening. There I had rich soil by the organic method. I knew little of composting but a lot about organics otherwise. Shortly after arriving here I became interested in gardening as the results of the local talent were none too good.

One evening, while preparing the soil for flowers, a neighbor came over to watch. Introducing himself he inquired, "Going to grow some flowers?" I explained that I was preparing the soil for that objective. Upon learning that I would not plant until the following spring he was astounded. Preparing the soil in May for the following spring? I incorporated large quantities of manure, peat moss, and sand. No fertilizer? No commercial fertilizer!

In September I planted rye. This I permitted to grow 8 inches in height then turned under. February came and it was chilly weather about an average of 42 degrees during the day. I began to work the soil and plant. Soon the seedlings began to come up

Please mention ORGANIC GARDENING when answering ads.

HARROLD'S PEDIGREED STRAIN

TUBEROUS BEGONIAS

(American Grown)

It is probable that no flowering plant has come so much into the public favor during the past decade as these Tuberous Begonias. Their huge, brilliantly colored flowers and luxuriant foliage make them the most attractive thing in the garden during their blooming season which extends from mid-June until frost. Culture is relatively simple being covered completely by our 8 page booklet that accompanies every shipment of tubers or plants. They are most at home in shade where they bloom well, differing in this respect from most other flowering plants.

Insist on American Grown tubers. They are far superior to those that are imported in strain quality. American stock has uniformly larger flowers, more uniform plant habit and because of a longer growing season the tubers are more mature making them of easier culture. They are better acclimated to our growing conditions. While wholesale prices of imported stock are lower you will find very few available that retail at more popular prices than we quote here on American Grown tubers. Order early while selections are complete.

GIANT CAMELLIA FLOWERED DOUBLE

This type is probably the most popular of the entire family. Huge Flowers sometimes 10 inches and seldom smaller than 4 inches across; if culture is reasonably good they look like giant double Camellias. The colors are luminous and brilliant in shades not duplicated in any other garden flower. Colors: Apricot, orange, pink, rose pink, red, rose, salmon, scarlet, yellow and white. Your choice or mixed.

GIANT CARNATION FLOWERED DOUBLE

The second most popular type. Flowers resemble huge Florist Carnations in form. Not quite as large as the Camellia type but one of the sorts you will definitely want in your collection. Colors the same as listed above except for rose pink which is not available in these.

Prices of Either of These.

DORMANT TUBERS: 3 for $1.00; 6 for $1.50; 12 for $2.50; 25 for $5.00

STARTED PLANTS: Shipment late April through June. 3 for $2.00; 6 for $3.00; 12 for $5.00; 25 for $10.00

NOVELTY TUBEROUS BEGONIAS

We offer one of the largest selections of novelties in America. Twenty different types and named kinds, all listed in our free color catalogue. Your copy gladly mailed on request. It also contains much cultural data. All tubers are Blooming size. Sent postpaid in the U. S.

HARDY PRIMROSES (POLYANTHUS—VERUS HYBRIDS)
HARROLD'S PEDIGREED GIANTS

Here is a new, really giant Hardy Primrose which we have bred during the past ten years. The huge flower heads are often 8 to 10 inches across with individual florets 2 inches in diameter. Flower stems are often over a foot long and plant habit is very robust and hardy. The coloring is the most attractive thing about this plant. It includes a wide range of shades such as yellow, red, orange, flame, purple and white in the more common shades along with many novelty pink, cream, terra cotta, blue and duo-tone colors. Self blotched and laced markings. You'll certainly want this new one in your shaded rock garden. Cultural instructions with each order. Available in mixture only.

SEEDS: Plant these now. Packet, About 150 seeds, $1.00; 3 pkts., $2.50.

SEEDLING PLANTS: Set this spring these will bloom well next spring and show some color this year. 25 for $2.50; 50 for $4.50; 100 for $8.00 postpaid.

YEARLING PLANTS: These will bloom well this year. Price 6 for $2.50; 12 for $4.50; 25 for $8.00 postpaid.

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P. O. BOX 29 E **HARROLD'S** **GRANTS PASS, OREGON**

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(size controlled to your needs)

Open a Whole New World of Pleasures to the Home Gardener

Delicious full size fruit at 2 to 3 years old. Dwarfs grow 6 to 8 ft. high (semi-dwarfs 12 to 15 ft.). Take little space, easy to care for. APPLES: Many varieties; True Malling stock—pedigreed by Malling Station. Also PEACHES, PEARS, PLUMS, APRICOTS, NECTARINES, CHERRIES.

$2.50 to $15.00 each, according to age.

Learn All About These Early Bearing-Size Controlled Trees In Time to Order for Spring Planting

WRITE NOW for my FREE CATALOG No. L (fully illustrated)—the result of my specializing exclusively, 20 years in this country (my Swiss Ancestors 100 years) propagating fruit trees. It will guide you in selecting trees suitable to your individual needs: point out the problems in the planting and culture of DWARF trees.

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Port Chester - New York

King Street Opp. Comly Avenue

Pat. June 16, 1942 Pat. No. 2286568

The Petry
INSECT DESTROYER

This trap is designed to destroy harmful insects including June bug, Japanese beetle, coddling moth, curculio, peach borer, rose beetle, corn borer, gypsy or tent worm, web worm, and many others. The above cut shows what one trap in a corner of your lawn or garden can do in one season. The trap is economical to operate, as it is plugged in any ordinary house or garage wiring. Small size, $7.00; large size $11.00.

DIRECTIONS

Place trap on level base and fill pan within ½ inch of top with water: then add ½ inch of kerosene, plug in and it is in operation. It works while you sleep.

Manufactured by
A. C. PETRY
2802 DEWEY ST., ANDERSON, IND.

and grow. These of course were winter hardy for this climate. Then an amazing thing occurred! The neighbors just began to work their soil and had to use picks to break it up. White alkali stood out on the soil surface glistening like snow in the sunshine. My soil was loose and loamy and BLACK!

May came and my flowers were producing prolifically. Theirs with weak blooms were merely struggling for existence. Soon it was proposed that a Garden Club be formed. I was appointed president and then a revolution began for I was teaching Organics. Bang! The arguments were many but soon by taking the club to my house these arguments ceased. Now the movement is quite firm and other Garden Clubs are seeking advice from our group.

This valley is of tight calcareous soil and practically devoid of humus. It is of light tan color and hardens into adobe when wet and dried. It is high in calcium carbonate. It has plenty of natural potash and phosphorus but lacks nitrogen. This latter due to the lack of humus and thunderstorms.

May I compliment you for your very intelligent return to NATURAL soil science? When Americans decide that a 'kick-in-the-pants' is not enough and that nature has the intelligence from God, better health, food, and longer life will result. Disease is the result of disobedience to natural *law* and we reap accordingly. Keep this great work up!

Richard E. Nedle,
General Delivery,
Phoenix, Ariz.

—o—

ANOTHER CONVERT

January 4, 1948.

Dear Sirs:

After discovering your magazine and visiting the garden of another organic gardener, I was an easy convert to your way of thinking. Let us hope the future will bring more waste conver-

FEED YOUR SOIL!

Use ActivO Ruhms Phosphate Rock Earthworms and Compost Limestone all Great Soil Conditioners. Send for facts (3c Stamp appreciated.) Or order direct from ad. Act NOW to insure prompt delivery and avoid spring rush!

ACTIVO

No. 1 size (for Compost Cabinet) $3.95 (doz.)
No. 2 size (treats up to 450 lbs. waste) $1.00
No. 7 size (treats up to 1800 lbs. waste) $2.00
No. 25 size (treats 3 tons waste) $6.79

EARTHWORM CULTURES

2 containers $2.50; ½ Gallon $6.00; 1 Gallon $11.00

RUHMS PHOSPHATE ROCK

100 lb. bag $2.50; Ton $30.00 F. O. B. Townsend

SPECIAL COMBINATION

No. 25 size ActivO plus 100 lb. Compost Limestone $6.79 shipped freight or express collect. ACTIVO No. 50 (treats 6 tons waste material) $9.95 shipped freight or express collect.

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P. O. BOX 131-C-2 TOWNSEND, MASS.

At last A LOW COST ELECTRIC MOWER FOR *Everybody!*

Now you can enjoy care-free lawn-mowing. SENSATION'S new, low-cost Model B 17 E Electric Mower helps build beautiful, healthy lawns. SENSATION'S patented whirling blade clips grass, then chops clippings into rich, lawn-building mulch. It adjusts to close-clip Bermuda or St. Augustine grass to a smooth carpet . . . or to cut blue grass above seed sheets, permitting self re-seeding for a velvety green lawn. SENSATION eliminates raking . . . reduces hand clipping. Mows weeds, too.

SEND FOR FREE BOOKLET TODAY

Please mail me detailed Question and Answer booklet and name of nearest dealer displaying Sensation.

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sion plants so that as much as possible of the plant and animal residues may be returned to the land. Organic gardeners who lack facilities for making compost are most eager to find commercial sources of this priceless fertilizer.

Robert J. Davis,
92 State Street,
West Englewood, N. J.

—o—

ORGANIC'S CHAMPION

February 1, 1948.

Dear Sirs:

In the Boston *Sunday Herald* of January 25, 1947 Mr. Ray Koon had an article ridiculing organic gardening and its claims. It is a very simple matter to make fun of anything by writing about it. How about actions to prove it? Why not have a really large test made of organic gardening methods and compare the results with those obtained by using the accepted methods of fertilizing with chemical fertilizers and spraying and dusting with inorganic and organic poisons? Is Mr. Koon afraid of what the results might show?

I have tried the chemical fertilizer and spray method of home gardening and found the results to be unsatisfactory. Then I heard of Organic Gardening and their methods, tried them, and have been satisfied enough with the results to want to try them on a larger scale. I sold my other place, a quarter acre, and bought this place in Randolph, consisting of one and one-half acres. Last year I started with a small garden and set out some fruit trees. You are welcome to come out each year and make an inspection and report to your readers of the results of organic gardening. Also you can make a comparison with a place of similar size using the chemical fertilizer and spray method of growing produce.

At my last address I had two peach trees. I did not use chemical fertilizers or sprays yet I harvested a satisfactory crop while my neighbors who used

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ROYER Compost Shredder-Mixer

Spend those extra, Royer-saved hours in the old hammock! The only work involved is shoveling materials into wide, low hopper. The Royer shreds, mixes, blends, aerates and discharges 1 to 3 cubic yards an hour of fluffy, open compost. Eliminates loss of organic materials by assuring even fermentation. Send for Bulletin 46.

Royer C-Jr.

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HOTBEDS WITHOUT FRAMES OR SASH
Gain a month in spring by sowing early seed in open ground over electric soil heating cable. Seeds grow fast in warm soil—have outdoor hardiness and vigor.
FREE! Plans-Data
40' cable . . $1.60 80' cable . . $3.20
GRO-QUICK 381 A W. HURON ST. CHICAGO 10, ILL.

. . . that deliciously *different* taste of food cooked outdoors over fragrant wood or charcoal fires. BE THE PERFECT HOST! With a Hancock Outdoor Fireplace, your parties become occasions both charming and memorable. So simple to build, too, with the Hancock "skeleton" unit. Ovens and spits available. Send dime for 4-page Plan Sheet—"HOW TO BUILD YOUR OUTDOOR FIREPLACE"—with working drawings for a variety of designs.

HANCOCK IRON WORKS
80 West Pike St., Pontiac 14, Mich.

chemicals in the form of fertilizers and sprays were unable to harvest a crop because of insects and diseases.

When I stopped using chemicals and used compost instead, the earthworm population multiplied very rapidly. While using chemicals the earthworm population did not increase but seemed to be gradually dying out. I would like to have Mr. Koon explain these results in the light of his experience in gardening and in accordance with his writings in the Boston *Sunday Herald*.

All any of us disciples of organic gardening ask is a fair and impartial test of organic methods as compared with the chemical methods. That is one thing that you, Mr. Koon, and your cohorts seem afraid to do.

Robert L. Smith,
144 Liberty Street,
Randolph, Massachusetts.

—o—

EUCALYPTUS LEAVES

February 5, 1948.

Dear Sirs:

For the sake of other Californians, who may, like us, have easy access to eucalyptus leaves I wish to correct an impression you seem to have formed and given to your readers. Eucalyptus leaves do make good mulch. They are not at all poisonous, as some people seem to believe. Although the roots of the trees are heavy feeders, and tend to rob the soil some distance from the base, the ground right under the tree is rich, and a large variety of plants will grow well and luxuriantly directly around the tree . I have used nothing but these leaves, steer manure, and rocks to mulch guavas, figs, peaches, orange and lime trees, young and boysenberries, and many ornamentals. The results I've had compared to my neighbors who use chemical fertilizers and no mulch have been amazing enough to convince one neighbor that organic gardening is

really worth the time and she is now saving and using her leaves. The only objection I can see to using them entirely by themselves is that they do pack quite flat, and it is therefore a good plan to mix them either with some other type of leaf, grass, or manure. You could, I am sure, suggest other materials which would be even better to mix with them.

Since they will decompose they can also be mixed in with the compost with good results. We have used them in this way too, and by the time the compost was ready they were as well decayed as all the rest of the material we had used.

Roberta E. Kiernan,
Laguna Beach,
California.

Clematis

ARISTOCRAT OF THE CLIMBERS

Ideal for
Arbor, Fence, Trellis or Wall

SPECIAL COLLECTION

JACKMANI. Violet-purple.
RAMONA. Lavender-blue.
MME. BARON-VEILLARD. Lilac-rose.
3 Plants (1 of each) for $2.50
Postpaid in U. S. A.

WRITE TODAY for your copy of our colorful, informative new 1948 Catalog. It's FREE!

JAMES I. GEORGE & SON
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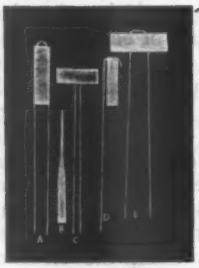
Metal . . . **Garden Markers and Labels**



Aluminum Standards - White Zinc Name Plates

(PENCIL MARKS STAY ON FOR YEARS)

Name plates can be replaced in a jiffy—
ALUMINUM Standards will not rust

PERMANENT — ATTRACTIVE

A—12" HAIRPIN TYPE Garden Marker with **LOCKRIM** Name Plate; Handy Streamline shape preferred by many 12" tall.
Prepaid Doz. 60c, 20 for $1.00, 100 for $3.50

B—7" WHITE ZINC plant Label. Mark anything, both sides takes pencil, easy to fasten, just wrap around and fold end over. Best for Dahlia tubers to store for winter. Have proved their worth for many years.
25 for 40c, 100 for $1.00, 500 for $4.00

C—9" DOUBLE WIRE GARDEN MARKER time tested by Hundreds of users who order every spring. The **WHITE ZINC** name plate can be marked on both sides. Replaceable. Aluminum standard.
Doz. 60c, 20 for $1.00, 100 for $3.50

D—11" SWINGING LABEL white Zinc Name Tab secured to single **ALUMINUM** Standard, adjustable to flat position for easy reading when standing over it. Can be pushed down flat for winter, nice for tulips and other bulbs. Will be bright and legible when springtime comes.
Doz. 40c, 30 for $1.00, 100 for $2.50

E—11½" OK ROSE MARKER. A new 1948 introduction Large **WHITE ZINC** name plate has wide flanges with four accurately spaced holes thru which stiff **ALUMINUM** standards freely slide up over the tilt into secure position. A new plate can be put on easily. The price is a little higher for this better marker but worth it.
Doz. 70c, 18 for $1.00, 100 for $4.00

TRIAL KIT: To acquaint new customers with our markers and labels we prepay Three each of A, C, D, E, and 25 B together with a weatherproof pencil all for $1.00.

EVERLASTING LABEL COMPANY, Box 593, PAW PAW, MICH.

Answer to Dr. Bear

LAST month I devoted this entire space to refuting part of a speech made by Professor Firman E. Bear at the annual convention of the American Plant Food Council at Hot Springs, Virginia on June 13, 1947. This part had to do with earthworms, which Professor Bear said were not affected by chemical fertilizers. We produced evidence to show that he did not prove his point. This month I would like to go over the rest of that same speech, because I think it is in the interest of the organic movement that this be done.

I like one part of his speech considerably. He said, "As a result of these widely publicized claims on the part of the advocates of manurial composts, the agricultural colleges and experiment stations are now being besieged with letters of inquiry from people in all walks of life." That is fine, in fact it is bully because it indicates that we are making progress.

Dr. Bear says that the chemical fertilizer industry is of tremendous proportions and that 35 million tons of chemicals are used annually. "Can it be that this is a gigantic fraud?" asks Bear. I lean over to Bear's side on this point and say "no, it is not a fraud for 'They know not what they do'." Most of these chemical fertilizer people have loving wives and children and surely they would not believe that the use of chemicals reduces resistance to disease on the part of people who eat food produced with such fertilizers. Would they permit their own loved ones to eat such food if they thought such was the case? They couldn't worship the Golden Calf to that extent, I am sure. Some of their very own wives and parents have died prematurely of cancer, but surely, they think the use of chemical fertilizers couldn't be a factor in bringing about this destructive disease. Of course a few physicians have said in print that they believe the use of chemical fertilizers may have such an effect, but perhaps the chemical fertilizer people haven't read their articles. At any rate I believe that the Agricultural Chemical Industry believes honestly that their product is needed and that therefore their business is justified. It is up to the organic group in a legitimate manner to teach them the error of their ways.

Dr. Bear then proceeds to describe experiments made by Theodore de Saussure of France 150 years ago and Justus von Liebig 50 years later in which they took plant matter and reduced it to ash. From this ash, which consists only of inorganic substances, they reason, that "plants find new nutritive material only in inorganic substances." The error of such an inference is so manifest that it is surprising when it issues from an acknowledged scientist. In reducing the plant to ash, naturally they have burned up all the organic matter. It is a property of organic matter that it will burn on the application of fire,

which is the reason why peat and dung are used as fuel in Ireland, India and other parts of the world. In other words, de Saussure and von Liebig in this experiment were like ostriches that placed only one eye in a hole in the ground. Their experiments were grossly defective and criticism of their work has been voiced by many men versed in agricultural science.

In the soil there always has been organic matter as well as inorganic. Each has its function. The organic matter cannot be charged off by waving a magic scientific wand. Nature does not burn up organic matter in one stroke. She draws upon it gradually and that farmer whose soil is rich in organic matter is a fortunate man. He farms with greater ease, with greater profits and with greater satisfaction. That the plant absorbs elements in organic as well as inorganic form has been proven. I cite one reference but there are many others. See the work of Thomas H. Mather of the University of Alberta, Edmonton, Canada written up in *Scientific Agriculture,* Vol. 10, 1929.

In recent medical experimentation a step has been taken beyond the vitamins. The latest discovery is that protein (amino acids) is of extreme importance in the healthful functioning of the human body. It is now believed that in the study of these amino acids will come the secret of human disease causation. Now organic matter in the soil enables a plant to assimilate a higher percent of protein. Dr. William Albrecht of the University of Missouri has shown that the use of chemical fertilizers makes for more starches and fats in the plant.

Dr. Bear, in order to prove that crops can be grown exclusively with inorganic matter, drags out the old red-herring experiment performed at Rothamsted, the world-famed agriculture experiment station in England started by John Bennett Lawes, a wealthy Englishman. Lawes chose the growing of wheat as the experimental base. One plot received 1392 pounds of fertilizer per acre ever since 1852, a 9-5-7 mixture being employed. This crop has been grown continuously to date, approximately 96 years. The crop yielded for the first 70 years 35.6 bushels to the acre. The yield for the first 10 years was 36.1 bushels, for the last ten years 27.4. Dr. Bear states that the figures for the last 25 years were not available to him when his speech was prepared. In this plot the wheat stubble was plowed under each year.

In another plot 16 tons to the acre of farmyard manure were used every year. The average for the 70 year period was 34.3 bushels per acre. For the first ten years this plot yielded 34.2 bushels and for the last ten 27.1.

Fertilizer Tests at Rothamsted

Period of Test	1392 lb. 9-5-7 per Acre	16 Tons manure per Acre
1852–1948	Bushels of wheat per Acre	Bushels of wheat per Acre
First 70 years	35.6	34.3
First 10 years	36.1	34.2
Last 10 years	27.4	27.1

There are many things wrong with this experiment. First, farmyard manure alone is an unbalanced fertilizer. The correct way to make organic fertilizer is to use three times as much plant residues as farmyard manure. This mixture makes a tremendous differ-

ence. There is also a question whether the manure used at Rothamsted was fresh or thoroughly rotted. Points like this are of extreme importance.

Then again, the picking of wheat as the experimental crop was not a good choice. Fertilizer is not nearly as important a factor in wheat as it is in many other crops. Suppose Rothamsted had chosen a heavy feeder like corn. If we can judge by the terribly reduced yields of corn in certain parts of the South where large amounts of chemical fertilizers have been used, we see how unscientific the choice of wheat was. In some of the wheat growing regions of the West, especially in the dust bowl, millions of acres of wheat are grown without a particle of fertilizer ever being used, inorganic or organic. In those same soils they wouldn't get anywhere with corn, without fertilizer.

If you start to investigate a little deeper into the Rothamsted experiment you find another factor which explodes it wide open. You will find that they have not been using the seed from their own crop for their succeeding crops. They have purchased outside wheat seed each year. One of the most important advantages of the organic method is that it enables the seed to endure. In certain primitive countries the seed is used for thousands of years, but in this country, we have what is called the "running out of the seed" where chemicals are used. Specially grown seeds have to be used. It is too bad that Rothamsted did not save and use their own seed.

Finally when you check into Rothamsted thoroughly you discover the most significant failing in the whole experiment. They can't make bread out of the chemically fertilized wheat. Bakers have checked and discovered a deficiency of gluten which makes the wheat worthless for eating purpose. The wheat from a mechanical point of view will not work itself under practical baking conditions into a loaf. It would be interesting to feed two groups of mice on both types of wheat grown at Rothamsted and check the results on their health.

The annual report of Rothamsted for 1906 contained the statement that "the Rothamsted Experiment Station has never been connected with any external organization but has been maintained entirely at the cost of Sir John Lawes." If we refer to the 1915-1917 report of Rothamsted we see a large list of chemical fertilizer manufacturers who have furnished money to this station. They include the Chilean Nitrate Committee, the Potash Syndicate, the Sulphate of Ammonia Committee, Nitrogen Fertilizers Ltd., the Gas Light and Coke Co., and Messrs. Brunner Mond and Co.

Another serious omission was that Rothamsted had to resort to a fallow in 1921 and the experiment was started anew from that point on. From Dr. Bear's speech he gives you the idea that the experiment was a continuous one down to the present year. The fallow lasted 10 years and the experiment began again in 1931. In his talk Dr. Bear said that he had before him the figures only for the first 70 years of the experiment, which terminates, strangely at this fallow of 1921. To mention the experiment at all should require the giving of all the facts. There were fallows in the first seventy years also, but they were of shorter duration.

In the 1938 report of Rothamsted it is stated that a study is being made of the diseases which occur when wheat is continuously grown on light land "with a view to finding some method of control. If this can be done, continuously or very frequently wheat growing with suitable artificial fertilizers, but without farmyard manure, should become possible on a wide scale." Evidently in the Rothamsted experiment they not only chose a crop like wheat which is one of the easiest crops to grow with an all-artificial fertilizer diet, but they picked the kind of land on which wheat thrives the best. The experiment was somewhat made to order.

In the next part of his talk Dr. Bear talks of the method of growing crops hydroponically, in water solutions in tanks, also in sand, using inorganic nutrients exclusively. He says, "Today luxuriantly perfect plants are being grown on a large scale by the use of purely mineral solutions in pure quartz sand that contains no earthworms and no organic matter." This typically shows the stupid weakness in this type of reasoning. Can you go merely by size and luxuriant appearance? Does this type of food contain the type of nutrition that will nourish the human race and enable it to be healthy and aggressive. If we are attacked can we fight off an invader with hydroponically produced foods in our bellies? Will seed from such crops continue to be viable in the fiftieth generation of such method of growth.

Only this morning I received a letter from a former G.I. in which he described the hydroponically produced foods they had to eat in Hawaii. He mentions the bitter taste of raw carrots so produced. Our *Soil and Health Foundation* is preparing for an experiment in which food will be raised hydroponically and its effect on the health of animals will be noted. That will be the most clinching answer.

Dr. Ehrenfried Pfeiffer, M. D., a regular contributor to *Organic Gardening* has worked out a method of making crystallization tests with copper chloride, which is extremely valuable in detecting disease in humans as well as in animals and plants. For this brilliant work he was given an honorary M. D. degree by Hahnemann Medical College of Philadelphia. On January 12, 1948 I received a letter from Dr. Pfeiffer which contained the following important statement about hydroponically grown food. "Crystallization experiments which we did last summer showed distinct differences as against normal soil-grown plants. The hydroponic plants were much weaker in vitality, and this ought to show up more markedly in several generations."

Bear becomes bolder as his speech proceeds. He then tries to show that the more chemical fertilizers used the more healthy we are becoming. He ties in the life expectancy figures with fertilizer tonnage. "In the year 1850," says Bear, "before farmers had begun using fertilizers, the average life expectancy at birth in the United States was 40 years. By 1900, when fertilizers were being used at the rate of over 2 million tons annually, our life expectancy had increased to 49½ years. By 1940, our fertilizer consumption had increased to over 8 million tons and our life expectancy to 63 years. In 1944, fertilizer tonnage reached the 12-million ton mark and life expectancy rose to 66¼ years. These figures show that in proportion as our fertilizer tonnage has increased so also has our life expectancy." This really beats all, coming from a scientist. By the same manner of applying comparisons we can show that the consumption of pickles has increased approximately in the same proportion as the increase in the life expectancy figures. Therefore, eat pickles and you will live to be 100.

Why has the life expectancy figure gone up? In 1850 it was 40 years. By 1900 it had gone up to 49½. Bear in mind that these figures represent life expectancy at birth. We know how medical methods and sanitation have improved from 1850 to 1900 so that far fewer babies were dying in childbirth. If a baby dies at birth it pulls down the average tremendously. The life expectancy figures were improved also because the medical profession made great strides in eradicating contagious diseases such as small pox, malaria, etc. In other words, through the improvement of medical and hospital techniques and a better knowledge of hygiene and diets, fewer deaths occurred. Fifty years ago, to go to a hospital for an operation meant death in a tremendous number of cases. You could almost call it an invitation to death.

Dr. Bear, you chose to take the life expectancy figures at birth which is a

highly theoretical proposition and is affected by complicating factors. Let us take the life expectancy, once you have reached the age of 40 and you will see that a person today of 40 cannot expect to live any longer than a person who was 40 years old in 1900. I know these figures because I was formerly the editor of a health magazine.

You have overlooked another vital factor in the consideration of the mortality statistics. There is a trend within a trend there, Dr. Bear. All the time that deaths from the contagious diseases have been going down, deaths from the degenerative diseases have been going up. Heart disease, cancer, kidney trouble are alarmingly on the increase so that one of these bright days when the contagious diseases are reduced to practically zero, and will no longer be able to warp the death averages, the yearly figure will begin to swing upward. I will give just a few figures on cancer deaths in the United States per hundred thousand of population, annually:

1935—108.2	1941—120.2
1936—111.4	1942—122.1
1937—112.4	1943—124.5
1938—114.9	1944—129.1
1939—117.5	1945—134.4
1940—120.0	1946—137.4

The figures for heart disease are even worse. Then new diseases are springing up which were practically unknown in the previous records of medicine: for example—multiple sclerosis which has come up during the last 40 years. It killed Lou Gehrig, the base-ball player. It has recently attacked the Governor of Arizona; and Dr. Asa Shields of the University of Virginia has come out openly at a medical convention where 1,000 doctors were present and stated that in his opinion multiple sclerosis stems from the use of chemical fertilizers. He has shown that this disease is unknown in countries where chemical fertilizers are not used.

In the case of the Governor of Arizona his disease showed itself while he was addressing a group of striking lettuce-packers in his home. His talk became a jumble of sounds. No one knew what he was saying. Multiple sclerosis destroys whole patches of the nervous system. It is ironic that these same lettuce-packers were working in the large vegetable projects for which Arizona is noted. Vegetable factories would be a better name for them. They use chemical fertilizers by the hundreds of carloads. Dr. Bear, can you take the full responsibility for your inference that the use of chemical fertilizers has made people live longer. Don't you think that the situation is serious enough so that your college, Rutgers, should undertake a long-term project to test the effects of food raised with chemical fertilizers on human health?

You have produced some figures, so I am going to mention a few. Health is measured not only by the number of people that are dying, but also by the state of health of those who are alive. Here is a statement from *Newsweek* of Jan. 12, 1948:

"One hundred years ago, the United States had a population of 17,069,453, and had 2,561 mental patients locked up in institutions. By 1940, the population had risen to 131,669,275, with more than 600,000 patients, and in 1947, with an estimated population of 144,708,000, there are more than 800,000 hospitalized victims of mental disease. In a century's population increase of 671 per cent (1840-1940), that of the institutionalized mental patients went up 23,328 per cent.

"Today, mentally ill patients occupy half of all hospital beds available, of which there are only 1,435,778, according to the American Hospital Directory for 1947. In addition, there are eight to ten million persons outside hospitals in serious need of adequate treatment, of whom more than 200,000 will enter institutions this year. These blunt statistics, recited to fellow psychiatrists by Dr. Michael Kasak, professor of psychiatry at Marquette University, and director of the Milwaukee County Hospital for Men-

tal Diseases at Wauwatosa, Wis., become even more shocking when lined up against the figures representing potential mental-disease care."

How about this, Dr. Bear?

On January 6, 1948, The New York University—Bellevue Medical Center Fund took an entire page advertisement in the New York *Herald Tribune* in which they said: "One out of 20 workers is sick *every day* in the year and that man or woman costs New York businessmen $480,000,000 a year!" Expressed in another manner this would indicate that the average New York City worker is sick about 18 days a year. How much compost could be made with $480,000,000.

This is an answer also to those persons who admit that the use of compost will contribute to the health of the public, but that it is too expensive to make.

I could use another ten or fifteen pages in discussing Dr. Bear's speech, but there isn't the space in the magazine. The worst part of it is that newspapers and magazines all over the country are publicizing Dr. Bear's talk, and it is misleading many people. The best answer to Dr. Bear and our other critics is to continue practicing the organic method on our farms and in our gardens. Results are the best answer to these critics.

J. I. RODALE.

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Large Scale Composting . . . .

By DR. EHRENFRIED E. PFEIFFER

THE largest compost heap of which I have heard contained several thousand tons of material, mainly organic wastes. A compost heap on a diversified or dairy farm can very well be as large as the manure heap deriving from the total production of the livestock on the same farm. About 200 tons of manure is produced on a hundred acre farm carrying 20 head of milking cows. On the same farm of which we speak, the farmer had built a compost heap 180 feet long, containing about 150 tons of compost. This farmer diligently collected everything organic which could be turned into humus.

The question has frequently been raised, "How is it possible to collect sufficient amounts of organic material?" And the objection has been made that all these composting procedures would take too much time and would not pay. Again, in talking with people, and in correspondence, we often encounter the opinion that composting is all right for the small gardener but that it does not fit into the large scale operations of a big commercial farm. In other words, it cannot be done economically and practically by the big fellow.

We have heard the formula "it cannot be done" so frequently that it has become an incentive to us to do it. When someone says this, it only shows that *he* has not done it, or does not want to, or does not see *his* way clear to do it.

Of course, we have to prove first of all that it is *worth* doing. If it is worthwhile, then we will be more inclined to spend some effort and pains to bring about the desired result than if we consider composting a senseless procedure.

There are two types of large scale composting. The one exists on large farms or truck gardens and is part of the entire fertilizing program. The other type is more or less independent of farming but is part of the disposal program of city waste, slaughterhouse waste, industrial waste from wool, cotton, sugar factories, and other "digestible" materials (not including the harmful outpourings of the chemical industry), sewage disposal, lumber wastes, sawdust, etc. The composting of all of this second group of materials on a large scale is a commercial proposition in itself and will be treated separately.

On the basis of prewar price levels, it was officially estimated that the manuring value of plain farmyard manure (not considering any treatment) averaged about $2.50 per ton over the United States. This is not the sales value, which varies considerably, of course, according to local conditions and handling. It refers only to the value of the fertilizing ingredients, of N, P, K, lime, organic matter, etc.

Compost that is made from any other organic material besides manure has a somewhat lower fertilizing value per ton, about 70% of that of

rich cow manure, for it is "diluted" with earth. This is valued, accordingly, at $1.60 to $1.70 per ton (again at prewar price levels). If I can produce compost for that much, fine; then it is worth that much to me. If somebody has to buy manure at $5 per ton and can substitute compost for part of it then the compost is worth 70% of the price he has to pay for the manure. This is the way it appears to the farmer who produces manure and compost on his own place. We know that in farm cost calculations the price of manure is set much lower. This is quite correct for the books. Should the farmer have to buy the equivalent of the manure in minerals the price would be near our standard figure as quoted.

In other words, if we could make a heap for $1.60 to $1.70 per ton it would pay to do it. Today (1948) we may very well double this price and could say that even at a cost of $3.20 to $3.40 per ton it would still pay.

The writer has kept detailed records of time, machines and wages involved in collecting material, digging the bases for the heaps, layering, covering with earth, watering, etc. One of the most expensive he has ever observed, cost $3.50 per ton. The average was $1.40 per ton and in some cases the expenses dropped below the dollar mark. These figures were taken from actual practice and farm records. It is only a question of good management, the use of time saving devices, skillful handling in order to keep the production costs low. The compost manager can apply his imagination and ingenuity fully here to improve the techniques. Surely there are many more machines to come which can facilitate the business. We have intentionally given this calculation a rough deal by not including the *humus* value of the final compost. If we add this the value may easily be doubled.

Now we come to the second point of large scale composting operations. Where do we get the material? One-third of the entire heap, in volume, should consist of earth which is used for interlayering and covering. Two-thirds consists of organic wastes. On a farm we find: chaff, old, spoiled hay and straw, dust from the granary floor and the bottom of the hay mow, scrapings from the barnyard, the yard and road scrapings (the latter are very rich). There are also the scrapings from ditches, hedge-row clippings, and the leaves in fall—he who burns his leaves is as foolish as though he kindled his fireplace with dollar bills. Then too, there is any amount of garbage and weeds, upon a thorough search one discovers still more resources: a pond cleaning once in awhile, a spring cleaning; chicken, pigeon, turkey, rabbit, dog and pig manures are best used in compost heaps. Yes, let us not forget the dust bag of the vacuum cleaner. The collection of these materials is made easy nowadays with mowing machines, mechanical manure loaders, dump wagons and trucks. Weeds can be mown and raked, straw too after combining, and picked up for transportation. Leaves can also be raked into large piles and then be picked up with the loader.

As stated above, on a 100-acre farm, about 150 tons per year of compost have been collected in this way. Additional sources would be green crops grown for that purpose or cover crops, f. i. in orchards. Then the farmer who grows beets, mangels or turnips has the tops of these plants for composting. Once the thrifty sense of the collector has been awakened many more resources will be discovered. It is merely a question of skillful planning and organization to save time in collecting. However, there are rainy days when one cannot work on the fields. There are land "cadets" as they are called now who could collect material in the summer or early fall.

In starting a large heap it is best to first plough or scrape the area and then remove the earth to the desired depth with the manure loader. We have been very successful in digging a trench two feet deep and as wide as we desired with the manure loader. The

earth can be heaped on the side and used for covering and interlayering, which can also be done with the loader. For digging you can use the bucket on the loader or you can scrape the dirt aside with the scraper blade. You can ride with a truck or wagon over the heap the long way and drop the material, if you leave a ramp at both ends and make the heap wide enough (12 feet f. i.). The watering can be done with a perforated pipe on top of the finished heap so that you need only to turn the faucet. The pipe can be connected with a pressure tank or operate by gravity. When irrigation is available one can lead the irrigation ditch right to the compost trench and let the water soak in from below. The loading of the finished material is again done with the loader and spread with the manure spreader, which is possible when the material is well broken down.

Besides the material available on the farm there might be a chance of obtaining wool dust, tobacco dust, milling dust, slaughterhouse refuse, garbage, sewage, sludge, etc. Paper waste is best burned up and the ashes used (these are rich in potassium). One farmer in Florida used the water hyacinths from the clearing of creeks and stagnant water channels. Another gathered the waste from a sugar factory. Others pick up pea vines and other refuse from canneries (very easily picked up when products are delivered and the waste material taken home on the return trip). Many materials of this kind can be had for the "taking." An excellent listing of compost materials appears in the "Manual of Organic Materials," The Gardeners' Book Club, Series 3, Number 1, published by Organic Gardening, Emmaus, Pa., 1947.

Any farm, large or small, needs compost. If for nothing else, at least for the top dressing of pasture and hayfields. Cows do not like to eat the lush grass which grows on their own droppings nor do they like to graze freshly manured grass or eat freshly manured hay. Here compost is in its proper place. It is a supplement for the fields too, when there is not enough manure. We apply it at the rate of 6 to 10 tons per acre.

The turning of compost heaps is a costly procedure. In small and medium sized heaps it can be avoided by building the heaps in layers and controlling the moisture content. In very large heaps we can distinguish two distinct zones of fermentation: the outer layer more or less aerobic, the core anaerobic. The outer layer enriches with nitrogen, the inner layer may lose nitrogen. In the case of such large heaps, turning is advisable, perhaps after two to three months. It can be done with a mechanical manure loader by preparing two trenches in advance with an interspace wide enough for the passage of a truck, tractor or wagon. The loader can then swivel the compost from one bed to the other. A manure conveyor as used by mushroom people can be used too.

Commercial Compost Makings

Any of the above mentioned industrial wastes, garbage disposal and peat can be turned into compost. Such enterprises will have large heaps. It is important that these heaps do not grow beyond certain limits, preferably not over 8 feet high and 20 feet wide, unless there is a possibility of mechanical turning with a snow removal machine for example, bull dozer or some kind of mechanical digger. Again one would use "half" trenches, about two feet deep and pile the material up to 6 feet above the ground. Watering is important. One of the first commercial composting enterprises was started fifteen years ago by M. Toussaint, at that time director of the Department of Hygiene of the City of Strassburg (France). The garbage of that city was collected in trucks. The householders were advised to keep two garbage pails, one for paper, broken chinaware, glass, tin, iron, i. e., all inorganic material and one for organic material. This enables one to avoid sorting the material at the dump, otherwise garbage would have to be sorted. Finally it is necessary and pays

well to pass the garbage through a shredder. Shredded material will rot more quickly, thus saving composting space and permitting a speedier turnover. Strassburg is surrounded by many farming communities and had an extensive streetcar system, including the villages. Street-box-cars transported the garbage to the compost yard and returned to the villages with the completed compost. Even cooking pots there disintegrated within a year in the pile.

The dumping places for compost manufacturing should have access to good surface soil since the composting process is more successful if topsoil is added. However, for reasons of economy, such places are usually located on waste land, gravel pits, etc. In the latter event, it is best to leave the bottom layer of the old compost heap as a "starter" for a new heap. A permanent system of irrigation can be installed. In turning heaps a rotation can be introduced so that fresh garbage and waste is interlayered with half rotted material (i. e. from the heap to be turned the first time). This procedure serves to inoculate the new heap with bacteria and will speed up the fermentation considerably. A second turning of the heap will secure thorough mixing and produce the final product.

In commercial composting the speeding up of the processes is essential. Here we deal with thousands of tons of material which require a large area. The quicker the turnover the less surface is needed. If the fermentation takes six months, for instance, instead of two months, three times as much material has to be piled up. It is here that turning machines pay very well, because, as already stated, turning results in aeration and a speeding up of the fermentation.

The writer could even imagine a system with transportable moving belts as they are used for the transportation of mining products. The arriving material would be shredded, dropped on a conveyor belt, transported to a particular heap or trench and deposited there. For turning, or layering, it would be loaded on the belt again with a loader and dropped on the new location.

A large town could thus use all garbage and sewage sludge and get all the necessary compost for its lawns, parks and gardens unless careful experiments have proved that the sewage sludge from sewage disposal plants is harmless as to bacteria, virus infections, etc. we do not advise sewage compost for vegetable production. But it can be used for lawns, flowers, shrubs, parks, pastures, cotton, i. e. for any crop which does not have a direct connection with human consumption.

The surplus potatoes which have last year been destroyed by the Department of Agriculture could have been transformed into valuable compost if only such commercial composting enterprises existed. An increasing compost and organic matter consciousness on the part of the people as a whole would help toward the establishment of such economically valuable arrangements.

Let us now describe the procedures on a medium sized farm, of perhaps 200 to 300 acres. The ideal treatment of manure is, of course, accomplished by using a loafing barn, or as it is sometimes called a deep stall. In this barn the manure remains, litter is added every so often, and the cattle gradually rise higher and higher on the manure. I saw such a barn in late winter, many years ago in Scotland, where the cattle almost touched the ceiling with their backbones, having about 6 feet of manure and litter under them. This mixture of litter, manure and liquid manure keeps in the very best condition. It is interesting to know that recently the New York Association for Grade A Raw Milk has recommended the loafing barn as the ideal and most sanitary way to keep dairy cattle. In fact, the writer has tested the principle of a loafing barn several times for heifers and calves here in this country and has found that the animals keep much cleaner than they would in stanchions. This manure

has a spongy, moist consistency, does not lose nitrogen, and can be brought out at once in spring. In general, a large loafing barn, with from 20 to 40 head, needs to be cleaned twice a year. The manure can be brought out with the manure loader and manure wagon to the very field where it is to be applied. There it can either be spread directly and ploughed under or it can be stored up until used. The storage, of course, is the process which we call the composting of manure. The manure piles are built up about 12 feet wide, 4 to 5 feet high and as long as you wish. It is wise to cover them until the time for ploughing is at hand, then the manure is loaded directly from the heaps and spread out. It is best to distribute the manure heaps along the edges of the fields in such a way that one has the fewest idle runs with the manure spreader. This is something which can be worked out on paper and adjusted in practice. Every farmer knows about how fast he can go with his manure spreader and can adjust himself accordingly.

The biodynamic method recommends the making of a compost heap using manure separately in heaps and also using green matter alone exclusively in other heaps. They do not follow Sir Albert Howard's Indore process.

With a stanchion set-up, the manure has to be brought out from the gutters daily. It is piled up in the same way, spacing the heaps along the edges of the various fields where it is to be applied later. We make a distinction between compost and manure. What has been described is the process of composting the manure under compost, the writer includes all organic matter, other than manures, which is piled up in compost heaps as described.

On a 200 to 300 acre farm there is a very large amount of compost material which can be collected. We have already mentioned how much waste, scrapings and diggings are available. In practice, we feel that manure and composted manure is best applied to crops which exhaust the soil, that is, corn, potatoes, onions, beets or any other heavy feeder. Compost is a material which is better applied to hayfields and pastures. The compost heaps, therefore, will be built up along the margins of the hayfields and pastures. On pastures, they have to be protected against the cattle so that they are not trampled down. A barbed wire fence, or snow fences are the handiest types for this purpose.

Now a few words as to the rate of application of manure and compost. When we speak of manure we mean either fresh manure or composted manure. Compost is the material which is collected on the farm and fermented, but without the addition of manure, that is, it is purely organic and vegetable matter of any and all kinds mixed with earth. Fresh, untreated manure, as it is usually taken out on the farm, loses most of its nitrogen even before it is ploughed under. This manure should be applied, for heavy feeding crops, at the rate of 12 to 15 tons per acre, to show any result at all. A composted manure which is very well-rotted, odorless, and of a nice brown color, crumbly in structure, can be applied at the rate of 8 to 10 tons per acre. Compost material, consisting of organic matter without manure, is usually not adequate for heavy feeders, it is more effective used as a top dressing on pastures and clover fields as described above. Of this material we usually apply 6 to 8 tons per acre to hayfields, 8 to 10 tons on other crops. To give a picture of how these amounts appear when spread on a field, we may mention that in the case of raw, bulky manure, a cover so that you do not see the ground, or only barely see it, corresponds to 15 tons per acre. A spotted covering corresponds to 10 tons per acre. Of the composted manure, a thin covering corresponds to 10 tons per acre, a very spotted covering, with 6 to 8 tons per acre. Of well-rotted compost, a spotted covering corresponds to about 8 tons per acre.

There is one difficulty we encounter in practice, in regard to the spreading of manures, and that is the manure spreader itself. A very crumbly, fine material does not spread well with the manure spreader. These machines are designed for moderately long material. Very long, bulky and strawy material, of course, make difficulties too. A very fine, earthy compost usually does not work well at all in a manure spreader. There is an urgent need to construct adequate machines to make compost spreading easier. At present, the main objections to composting methods are the time which is required for hauling and spreading and the difficulties of spreading a fine material. These things are very simple in a garden, there you can spread it by hand, but on a large farm we have to use mechanical equipment. The following is therefore meant as a sort of suggestion to the large machine manufacturers, to present certain ideas which might be taken up and lead finally to the construction of practical machines.

I am thinking here in particular of using a rotary spreader as it is used for lime and phosphate spreading, attached to the rear end of a truck. The material could be loaded on the truck, one man would stand on it and shovel the compost down the rotary spreader and this would distribute it. The material to be spread, ought to be relatively dry; moist, sticky material would jam up the spreader. Another idea would be to have a kind of large barrel, funnel-shaped toward the bottom, into which one can load more than 1 ton, probably 4 to 5 tons of compost. The rotary spreader could be protruding from the lower end of the funnel, and spread the compost. Such a barrel spreader ought not to be too heavy, it would be better to have a lot of manure in it and less weight of machinery to carry over the field. It could be made as an independent unit, or put on a truck. A very large farm would have two of these barrel spreaders and use them in the following way. One would be filled with the manure loader, at the manure or compost pile, requiring one man. A second man would take it out on a truck, or under its own power, and spread the material. A third man would follow the spreader with the plough or disc. By the time barrel No. 1 is emptied, the No. 2 barrel will have been filled with the manure loader. The second man would come back with the empty barrel and take out the newly filled one. In this way a continuous operation could be carried out with three men. We are sure that one could save at least half of the time needed for spreading, if not more, with such an arrangement. Up to the present, the farm machine industry has paid much too little attention to composting and manuring problems and we are sure that within a few years very practical machines could be constructed and sold at a fair price so that every farmer could afford them. Then the main objections to composting methods would be removed.

Join Our Garden Seminar

We invite our readers to join our garden seminar by writing a short article on the topic, "How I Plan My Flower Garden." The best article will be selected for publication in the *Organic Gardening Magazine.*

By

HERBERT

CLARENCE

WHITE

. . that earthworm again!

SHALL we organic gardeners continue the use of cover crops in the fruit orchard? That seems to be the $64.00 question in the minds of many of the followers of this "old-new" system of agriculture.

There is no doubt about it; cover crops properly disced in DO supply the soil with a certain amount of much-needed humus. But at what price? Transpiration in the cover crop takes huge, almost unbelievable quantities of moisture out of the soil, thus robbing the tender feeder roots working in the topsoil of their supply of water. They also consume large quantities of

nitrogen, which, according to the professors of agriculture must be re-instated in the soil in the form of ammonium sulphate—a chemical fertilizer — in order to partially compensate for the loss in this element caused by the rapidly growing cover crop. This Sir Albert Howard condemns as a poison causing "death and destruction" to the beneficient earthworm population in the soil where it is applied, as well as bringing about other unfavorable soil conditions.

Frank Hinckley—orange grower extraordinary, father of the "non-cultivation" method of citrus culture in California, keeps his splendid groves absolutely clean of all weed growth. He says that cover crops "take everything out, and put nothing back" into the soil. And his fruit-laden groves where cover crops are the "order of the day," towering above their neighbors, seem to prove his point.

On the opposite side of the fence is our Irish friend, Rory Collins of the famous Hood River country in Oregon, who advocates the use of cover crops to the "nth" degree. The article, "Lazy Man's Orchard," in the January, 1947, issue of *Country Gentleman,* reveals almost phenomenal yields in his pear orchards where weed growth is almost jungle-like in proportions.

All these conflicting methods and contradictory reports tend to confuse simple laymen like myself. WHAT TO DO is the big question. Who is right, and who is wrong? Or, are they both right? We are waiting for a definite answer from those who KNOW.

In the meantime, we play around in our own backyard, and observe what we find there. Perhaps some of our observations will provide food for thought, even though they don't prove anything.

Being a faithful follower of Sir Albert Howard, J. I. Rodale, and Dr. George Sheffield Oliver, most everything in my little garden revolves around one little animal — THE EARTHWORM. When making any decision as to agricultural procedure, I simply ask myself, "Is this good for my earthworms?" Will it improve their living conditions, make them happy, and thus stimulate their activity?"

If the lowly earthworm will actually perform all the marvels attributed to it as a biological soil-builder, a perpetual fertilizer factory, and a distributor of essential plant food, we organic gardeners must always give first consideration to the worm. We just cannot afford to "kill the goose that lays the golden egg."

This time my little boysenberry patch (See June 1, 1946 issue of *Organic Gardening,*) was destined to be "the guinea pig" in my experiment. On two rows of my miniature berry patch I placed a three-inch elm leaf mulch. On two rows I put no mulch.

In harmony with my expectations, during the fall and winter no weeds appeared between the rows that were heavily mulched. They were absolutely clean. On the "neglected rows," however, a fine crop of wild oats and other weeds soon made their appearance. At this writing this weed growth is over three feet in height—as fine a cover crop as heart could wish.

Last September, when the last count was made, there were over 200 baby worms to the pint of topsoil in these rows that had now grown up to weeds. Today, with this beautiful cover crop, these two rows produced only 75 baby earthworms to the pint of soil. The moisture content in the "castings" is almost nil, and no adult worms were found clinging to the roots of the cover crop when the weeds were pulled.

In the two rows that were mulched heavily with leaves last September, the castings under the mulch are still alive with young worms. Today I counted over 200 to the pint of soil! And even after a long dry spell the moisture content in the topsoil was equal to that of a squeezed out sponge. We were also pleased to observe that the castings in the rows that were mulched were over twice the depth (up to three inches) of the castings

where cover crops were allowed to flourish.

This is only a single experiment; and perhaps my observations mean nothing to you—but as for ME. I am convinced! And if I were to debate the issue, "Cover Crops versus Leaf Mulching," I believe that "leaf mulching" would win hands down! My little "Soil Experts"—the earthworms do not tell a lie. I can "bet" on their verdict every time. Almost three times the number of baby worms in the soil, and over twice the depth in earthworm castings mean almost double the quantity of neutral colloidal humus for the nutrition of my berry plants. To me, at least, *that* is significant.

I am inclined right here to agree with our good friend, Frank Hinckley of Redlands, who declared:

"If you will take care of the worm,
The worm will take care of the tree,
And the tree will take care of you!"

Henceforth, then, my Agricultural Creed will be very simple and short. Here it is, for the benefit of posterity.

"Whatever promotes the welfare and the happiness and the activity of the EARTHWORM, is *good.* On the contrary, whatever hinders earthworm activity or makes living conditions less acceptable to these little creatures of the soil, is *bad,* and should not be tolerated in the garden or on the farm."

For better or for worse, through thick and thin—*my garden* is married to our friend, the earthworm—and that includes grey ones, red ones, Dr. Oliver's famous hybrids, giant night crawlers and ALL. We love 'em!

Straw Mulching in Vegetable Garden Encourages Earthworms

The Soil and Health Foundation

A large number of readers of the *Organic Gardening Magazine* have made a contribution to the SOIL AND HEALTH FOUNDATION, and we feel sure that many more will do so soon and thus avail themselves of the unusual opportunity of sharing in carrying out the purposes of the Foundation. We want to make it clear to our readers, however, that they are in no way obligated to contribute to this Foundation. It should be regarded rather as an opportunity to have a part in a far-reaching program concerned with the conservation of our soils and our health. As organic gardeners and farmers, you appreciate more than the gardeners and farmers who practice artificial methods the fundamental importance of the conservation of our soils and the prevention of degenerative diseases of plants, animals, and man by maintaining our soils in good tilth. It is necessary to establish laboratories, experimental farms, and schools to teach and to illustrate to the masses of our people what most of you already know from your own reading and experience. Even we, who know from experience that compost-grown plants are reasonably free from diseases and insect pests and as foods are rich in minerals, vitamins, and other nutrient materials essential to normal health, want to see these facts checked by carefully executed laboratory experiments. The most important urge in human life is good health. We may be sure that just as soon as the average person becomes aware of the relationships between fertile soil, healthy plants free from diseases and insect pests, and human health, the SOIL AND HEALTH FOUNDATION will have the support of all.

Each month we shall keep you informed of the progress that is being made. The possible relationship between foods grown in chemically fertilized soils and cancer is being studied in the Biochemical Research Laboratory, Spring Valley, New York by Dr. Ehrenfried Pfeiffer, as has already been announced. Preliminary studies on the effects of artificially-made chemical fertilizers on earthworms have been in progress for the past several months and will be reported in the first bulletin of the Foundation. The results which have already been obtained are of such fundamental importance to all who are interested in maintaining and increasing the fertility of the soil that they should join the SOIL AND HEALTH FOUNDATION promptly so as to get all of the bulletins. The first bulletin will appear about March 15 of this year, and other bulletins will appear quarterly thereafter.

We want to make clear to the members of the Foundation that all of their contributions are being used for such equipment as is absolutely necessary for the actual experiments. Mr. Rodale is giving liberally of his time and is furnishing without cost to the Foundation a temporary laboratory building and a greenhouse for the experiments involving earthworms and the growing of plants and experimental animals. Dr. Ehrenfried Pfeiffer has donated his services in connection with the cancer experiments. I am giving to the Foundation, without charge, such time as is necessary to plan and direct the experiments which are being carried on in our temporary laboratory and in the preparation of the research bulletins. We get pleasure and satisfaction in giving our time and money to this worthy cause. If you wish to become a member of the Foundation, we invite you to do so at once in order that we may get the equipment that is necessary to a modern research laboratory. You will thus become a participant in the greatest undertaking of our day—good health.

Send all contributions to: SOIL AND HEALTH FOUNDATION, 46 South West Street, Allentown, Pennsylvania.

William H. Eyster, Secretary.

BOTANY
for the Organic Gardener (5)

By DR. WILLIAM H. EYSTER

PLANTS OF THE SEA (Concluded)

The Red Algae

THE green algae, as we have seen, inhabit fresh waters and the surface waters of the sea and constitute the first link in the food chain of marine animals. The brown algae occur in the subsurface waters and often are so large that they may be regarded as the giants of the sea. As we pass into still deeper waters, the brown algae are replaced by the red algae which vary from almost pure green to deep crimson in color. In addition to the pigments which are present in the green algae, the red algae contain a red pigment. It is believed that this red enables the red algae to absorb and utilize the shorter wave lengths of light which penetrate the water more deeply than the longer wave lengths. The red algae occur in the deeper waters along coastlines and often extend into the bays and mouths of rivers, although a few genera live in fresh waters. *Batrachospermum,* for example, occurs in a small brook which drains a mountainous ridge from which iron ore was at one time mined near Winfield, Pa.

The structural characteristics of some red algae are illustrated by the drawings in Fig. 14. Some are very delicate and are made up of repeatedly branched strands of filaments so that they have a structure similar to that of a rope. The larger species are leaf-like, coral-like, or cactus-like in structure and are more or less fleshly as they are made up largely of colloids.

The red pigment enables the red algae to adapt themselves to lights of different wave lengths. Consequently, the red algae can live in deep waters where no red light penetrates and where the available light has a high percentage of green wave lengths. Ordinary light, as is well known, is made up of a mixture of lights of different wave lengths as may be shown by dispersing the constituents of light by passing it through a prism. As sunlight penetrates the water, the longer wave lengths are filtered out and only the shorter ones penetrate to the depths in which many red algae live.

Red algae can be collected for study on the beach after a severe storm which tears them loose from their deep-sea moorings and carries them up and deposits them on the sand and in the tidal pools on the beach. The large species may be pulled above tide level with draglines or collected in baskets, while the small may be collected in bottles or on mounting sheets for study in the laboratory. Permanent mounts of the smaller species may be made by carefully

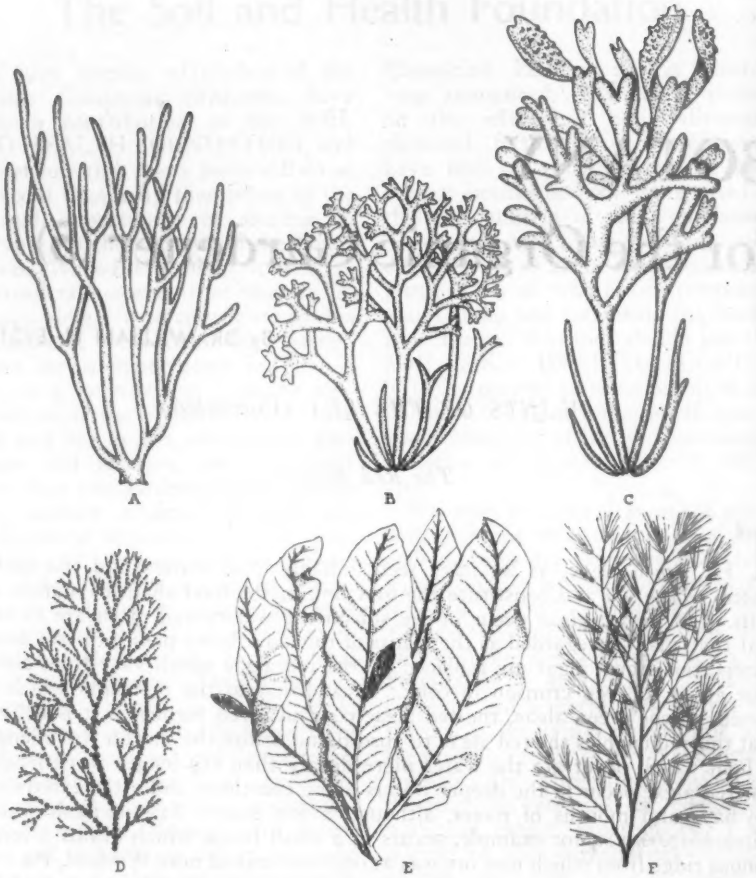


FIGURE 14

floating specimens on a piece of white mounting paper (herbarium sheets), and then lifting the paper out of the water in such a way that the alga assumes a natural position on the paper as the water is drained off. In the air it will dry fast to the paper and retain its natural color for years without fading noticeably. I have seen specimens of red algae with dates that indicate that they were collected more than a hundred years ago but still retain their brilliant red colors.

The alga marked *B* in Fig. 14 is commonly called Irish moss or carrageen. The collecting of this alga constitutes the oldest seaweed industry in the United States. At first the industry consisted in the gathering and preparing the seaweed as a crudely cured *moss,* which was used for making a milk dessert that somewhat resembles and tastes like a custard. Now it is also being used as a source of a highly purified colloid, carrageenin, which is used in large quantities in food, drug, and other industries.

Some of the red algae have long been regarded as important foods in the Orient, and now are beginning to be used by people in the western world. Those already being used in this country are Irish moss (*Chondrus cripus*), dulse (*Rhodymenia palmata*), and purple laver (*Porphyra perforata*). As foods for

man they are not especially nutritious because the digestive juices do not easily dissolve them. They must be regarded, therefore, as bulk foods and as sources of trace elements rather than as energy-producing substances. The best-known food made from Irish moss, common in the New England states, is blancmange. Dulse is used raw or dried as a kind of salad or relish, and in the kitchen as a thickener of soups, gravies, and sauces. Purple laver is used by the Indians of the Pacific coast as a food and by the Chinese for making their seaweed soups.

The larger algae of the sea are often referred to as seaweeds. Seaweeds are eaten by cattle which prefer it to some of the grasses and other food plants that are grown in deficient soils. Experiments carried out in many countries indicate that seaweeds have nutritive value to domestic animals, and supply them with elements that often are deficient in food plants grown in the soil. Seaweeds also are rich in important vitamins.

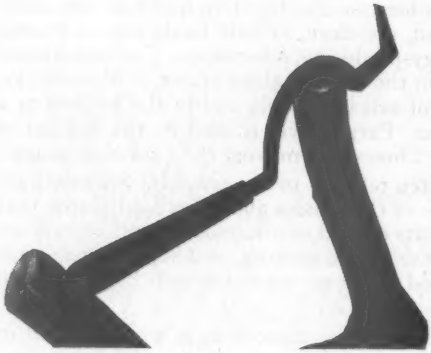
One of the most important products of red algae is agar which is used in the bakery, dairy, pharmaceutical laboratory, bacteriological and other biological laboratories, and in a large number of special industries. It serves as a moisture-holding medium in fruit cakes and icings, and is used in making chiffon pies. It is used as a stabilizer in frozen desserts and in such dairy products as malted milk and acidophilus milk. Confectioners use agar for making jelly candies and marshmallows. It serves as a base for soda-fountain syrup and as an emulsifier and binding agent in medicinal products.

The use of agar in the bacteriological laboratory is well known. Its use as a culture medium for growing bacteria and other microorganisms was first suggested by Fannie Hesse who found that it cannot be liquified by organisms which are cultured on it. This discovery was communicated to Robert Koch, the father of bacteriological technique who immediately recognized its great value as a culture medium. Agar is now being used in so many industrial products that it would require a volume to describe them.

As nutrient materials are leached from the soil and carried to the sea, the plants of the sea become increasingly important as sources of essential body-building and health-promoting substances. The time may come when we will get the necessary carbon compounds from the land plants but we will have to depend upon seaweeds for many of the essential minerals. This will necessitate a marine agriculture. This would consist in the growing of plants in the sea which would be rich in the mineral elements or nutrients essential in the nutrition of land animals. It would involve the selection of those seaweeds which are best suited for this purpose. As a matter of fact, the Japanese now cultivate more than a thousand acres of purple laver. This consists in attaching pieces of the alga to bundles of bamboo which are then thrust into the sea and anchored in positions suitable to the growth of this plant. The crops from such plantings of algae are worth from $200.00 to $300.00 per acre on the basis of an uninflated dollar.

Goitre is practically unknown to the Japanese and other peoples who use seaweeds in their diets. This undoubtedly is due to the iodine content of the algae. Seaweeds also contain considerable amounts of iron, phosphorus, boron, chlorine, calcium, sodium, magnesium, copper, zinc, aluminum, potash, and other elements in more or less usable form. To the extent that seaweeds serve as sources of essential nutrients that are deficient in our common food plants, they may be considered health foods for soil organisms, all higher plants, animals, and man. The fertilizer value of seaweeds has already been referred to, but this source of plant nutrients is so important that it cannot easily be overstated.

(EDITOR'S NOTE: The next article in this series will be concerned with the microorganisms in the soil and compost heap.)



By DR. WILLIAM H. EYSTER

Anyone Can Do Grafting

Cleft Grafting

THE simplest and quickest way to transform healthy stocks of shrubs and trees of ordinary or unknown value into plants that will bear choice fruits is by grafting. Even though you buy budded and grafted stock from reputable nurseries, they may not be true to type. Or you may have a variety of apple or other fruit which you do not particularly like. In any case, you can change the fruits to meet your most exacting wishes by grafting new varieties on your trees. Grafting is so simple that any one can do it successfully.

The tools necessary for cleft grafting are shown in Plate A. These include a good grafting tool, saw, hand pruner, sharp pocket knife, grafting wax, oil can with oil, pail with hot water, and scions which are clearly labeled as to variety.

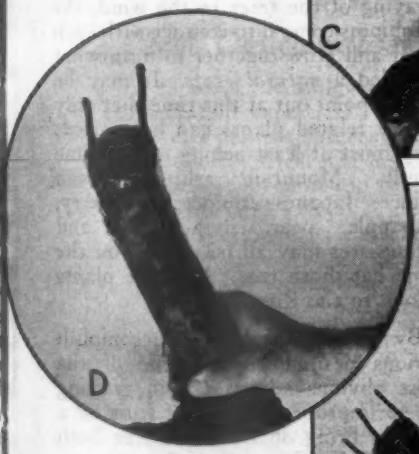
The tree that is grafted is referred to as the *stock*, while the twigs that are set into the stock are called *scions*. For scions, one-year old twigs must be used. Select vigorous twigs from 9 inches to 12 inches long and about 5/16 inch in diameter, and cut one scion from the middle section including a section of a twig with three buds, with space below the lowermost bud for making a

wedge-shaped base. The top of the scion is cut flush with the tip of the upper bud of the scion. Cut the stock to be grafted about two feet from its base. Then cut it back again about 6 inches further so as to get a clean cut with no tears in the bark.

The grafting tool is then laid across the top of the stock being sure that it is properly centered. Tapping the grafting tool lightly with the hammer will split the stock open for the insertion of the scions. Now insert the wedge shaped tip of the grafting tool in the split stock to open it for the scions, as shown in Plate B. Be sure that the green layer of the bark, called the cambium, meets the similar layer of the stock. It is the cambium of the scion and the cambium of the stock that will grow together. After the scions are accurately placed, carefully remove the grafting tool without moving the scions as

B

C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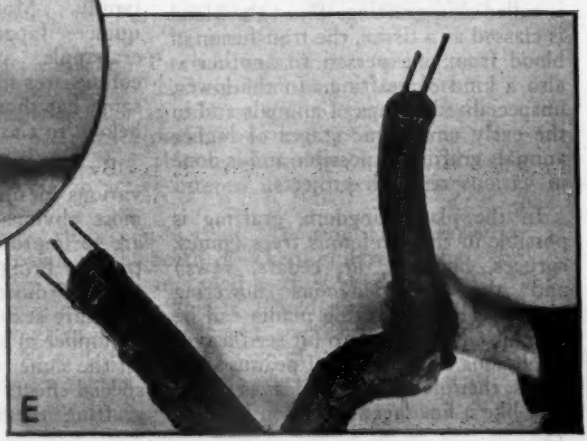
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shown in Plate C. In each stock may be placed two scions (Plate D) or even four scions (Plate E).

March days often are so cold that a pail of hot water is necessary to keep the grafting wax soft and pliable. To prevent the wax from sticking to your hands, cover them with a film of oil. Knead the wax in your hands until it is quite soft and then, without moving the scions the least bit, apply a layer of wax approximately a quarter inch thick over the top of the stock and down along the sides as far as the bark has been split. Now take a small bit of wax and cover the tip of each scion to prevent drying out. No matter how many scions are set one invariably outgrows all others. This one is selected and the others can then be cut off. Do not permit the new grafts to bear fruit until about the third year. Make a point of checking on your grafts about once a month to see that the wax does not work loose and expose the stock to drying out.

Grafting is a general term which means the physical growing together of two organisms, the transplanting of a part of one organism on another, and the transplanting of a tissue from one organism to another or from one place to another on the same organism. Transplanting skin from one part of the body to another or from one person to another as was done in healing the wounds of soldiers in the last war is called skin grafting. Since the blood is classed as a tissue, the transfusion of blood from one person to another is also a kind of grafting. In the lower, unspecialized groups of animals and in the early embryonic stages of higher animals grafting is possible and is done in various research projects.

In the plant kingdom, grafting is possible in the coniferous trees (pines, spruces, hemlock, fir, cedars, yews) and the dicotyledonous flowering plants. These flowering plants can be recognized by their two fat seed leaves so obvious in the seeds of peanuts and beans, their netted veined leaves which look like a fine lacework when held up to a source of light, their floral parts which are in 4's or 5's usually, their bundle arrangement in the stem which is in the form of a circle as seen in a cross section of the stem, and by the presence of a cambium on the inner face of the bark. It is this cambium, which occurs also in coniferous trees, that makes grafting possible. All other flowering plants belong to the monocotyledonous class which have only one seed leaf, the veins in the leaf run parallel to each other from base to tip of the leaf blade, the floral parts are in 3's, the bundles as seen in a cross section are scattered throughout the entire stem, and there is no cambium. Since there is no cambium, these plants including the grasses, lilies, aroids, irises, and orchids, cannot be grafted.

It sometimes happens that a part of one tree is pressed so closely against the trunk or branch of another tree of the same species that strange and spooky sounds are made by the rubbing of the bark of one tree against the bark of another. When the bark layers separating the cambiums of the two trees have been worn away by the swaying of the trees in the wind, the cambiums come into contact with each other and grow together to form what is called a *natural graft*. It may be well to point out at this time that only closely related plants can be grafted; they must at least belong to the same family. Mountain ash, European quince, Japanese quince, Juneberry, crabapple, pear, pyracantha, and cotoneaster may all be grafted on the same hawthorn tree. All these plants belong to the Rose Family.

By grafting one can accomplish various desired ends. Some of the most obvious advantages in grafting are to improve the kind of fruit on a tree, to bring on the same tree both sexes of dioecious plants in order to facilitate sexual reproduction, to have a number of kinds or varieties of fruit on the same tree, and to produce such special effects as, a) dwarfing pears by grafting them on quince stocks, b)

adapting plums to sandy soils by grafting them on peach stock, c) adapting apples to cold climates by grafting them on Russian apple stocks, d) increasing the size of pears by grafting them on quince stocks, e) increasing and modifying color of foliage and fruits by grafting one species on the stocks of another, f) avoiding suckers of lilacs by grafting them on stocks of privet, and g) increasing the fruitfulness.

Even after grafting, the stock and scion retain their own individuality although they may influence each other in various ways. The stock should be well acclimated to the conditions under which it must grow and should be hardy, non-suckering, adaptable to a wide range of soil types, easily obtained from seeds, and have a good root system. The scions should be collected in midwinter and stored in a cool place in moist sand or sawdust. However, the scions may be collected anytime before the buds begin to enlarge in the spring. For scions the strong vigorous twigs of the previous season's growth with well matured buds should be chosen.

It is time to graft when the buds of the stock just begin to swell. This is an indication that the sap is active. If this procedure is followed, your grafting will be done at different times, at the times indicated by the swelling of the buds of the different stocks upon which grafts are to be set. There will be a different time for grafting plums, apples, cherries, apricots, and other trees and shrubs.

The essential technique in all grafting is to bring the cambium of the stock into contact with the cambium of the scion at as many points as possible. This will insure certain and rapid growing together of the tissues of the stock and scion. After the scion is set in the stock, the entire cut surfaces of the stock and scion must be covered with wax to prevent the loss of water from the tissues. Common methods of grafting are 1) cleft grafting, 2) whip grafting, 3) root grafting, 4) top grafting, and 5) crown grafting.

Soil Deficiency and Teeth

Mr. C. R. Enlow (an associate of the American soil conservation expert, Dr. H. H. Bennett) has spent the last twelve months observing farm conditions all over the Union of South Africa. On his travels he has made an important observation quoted in the *Farmer's Weekly* (Bloemfontein) of July 31st 1946.

Speaking at a meeting in Pretoria, he said that 'in badly eroded areas 75 per cent of the children had poor teeth because of deficiencies such as calcium and phosphorus in the diet, while 75 per cent of the children had good teeth in properly farmed areas. For this reason many doctors in America were taking an active interest in soil conservation schemes.'

During recent years considerable attention has been paid in Great Britain to the teeth of school children. The connection between good soil and good teeth is beginning to be realized in some quarters. This is a field in which the practice of preventive medicine could soon bring easily recognizable results and it is to be hoped that here British doctors and dental surgeons will not lag behind members of their profession in the U. S. A.

More About Organic Gardening . . . .

By F. C. KING

(From "School and College Management," England)

NO useful purpose can be served by issuing a set of rules governing the making of compost, for conditions are never the same in two places, neither is the choice of material at all similar. Many systems of composting are being practiced in all parts of the world which are alike in principle but differ in detail. The humus manufactured at Levens by way of the compost heap is produced in a simple straightforward manner and proves very satisfactory in use.

In building up a stack of waste vegetable matter I do not use the sandwich method so freely advocated by some writers. As far as possible all waste is mixed first outside the bin. If animal manure is not so mixed then it goes into the bin in a layer, but the surface of waste vegetable matter already stacked is eased up with a garden fork to allow the manure to fall into the rest of the waste and so become mixed. For the production of general crops the material used in a compost heap should be as varied as resources permit.

If I have a preference for any particular type of material it is for the more matured growth. I prefer rough grass with the seed nearly ripe, to lawn mowings. I believe the matured growth to be richer in plant food elements than young, succulent leaves and stems. All compost heaps should contain woody material to furnish food for the fungi. Sufficient woody material ensures the free passage of air within the heap and prevents its too early collapse.

I value domestic waste highly, particularly tea leaves and the dregs from tea cups which contain a little milk. Milk is a fine conditioner of earthworms, as most anglers know. Kitchen scraps I place direct on the compost heap and cover with a little dry sawdust in summer which renders this material odorless.

All compost heaps should be supplied with a little soil, but the quantity required in a heap is small. It is an easy matter to supply all the soil a heap needs in the summer, when hand weeding is being done. Annual weeds when pulled should be shaken to free the roots of soil, and this will prove sufficient. Some people are afraid of using evergreen leaves, but this is a mistake. At the present moment one of my large bins is full of a mixture of yew clippings and horse manure obtained from stables where the animals are bedded with sawdust.

After being stacked for just three weeks the thin covering of sawdust manure is a seething mass of earthworms. I have noticed that beneath the many yew trees in this garden,

weeds of all description grow freely in the carpet of fallen yew leaves to be found on the gravel walks during this period of labour shortage. Every year when the yew trees and hedges are cut I have many tons of clippings to dispose of which are composted, and I cannot recall a single instance of crops suffering where this compost has been applied. Box, ivy and yew clippings are all composted here with no visible ill-effect to the soil.

At first there is a natural tendency to overload the heap with material of a nitrogenous character in order to produce record crops in weight and size. The popularity of many chemical activators is due to the manner in which crops appear to grow strong and healthy in composts where such-like substances have been used to rot down the vegetable wastes. Yet how often do we see these apparently strong and healthy plants attacked by pests and disease?

After the completion of the heap it should be allowed about four weeks in which to settle down before it is turned. If we have two bins side by side, then it is an easy matter to transfer the contents of the one into the spare bin, but if no other bin is available then it is best to remove the bin first and re-erect it near the standing heap. A little care is needed in turning the material so that the cold top and the cool sides are placed in the centre of the heap in order that the material may ferment.

This first turn enables us to see if the compost is working along the right lines. By the end of four weeks the fungi should be abundant and the centre of the heap should be fermenting. There ought to be a good number of earthworms inside the heap. The material in the centre of the heap should be showing signs of crumbling when the first turning of the heap is undertaken. If the contents of the heap are unduly moist at this stage the fungi cannot work, but this can also be the result of too little oxygen.

A light, airy heap is the one which turns out the best compost and the inclusion of hard woody material, such as prunings or vegetable stalks, will always prevent the too early collapse of the heap and provide pockets within the heap for an abundance of air. At this stage we want to also make provision for the escape of carbonic acid gas, which retards fermentation. If we are unable to use sufficient prunings or vegetable stalks to keep the heap open, then we must make ventilation holes from top to bottom of the heap to allow oxygen to enter and carbonic acid gas to escape.

I may mention in passing that in my large bins I use old drums, buckets and tins which I consider greatly assist with the aeration of the heap. If the heap appeared satisfactory at the time of the first turn, a second turning of the heap will be called for in four or five weeks' time. By now much of the original material will be in an advanced stage of decomposition and will be approaching that formless condition we call humus. A good heap should be literally alive with earthworms—I have counted more than three hundred in an ordinary forkful of ripening compost—and from this time onwards no special provision need be made for a supply of oxygen.

After its second turn the compost may be allowed to remain undisturbed for another four or five weeks to ripen, when it will be ready for use in the garden. The first few heaps may need about fifteen weeks from completion of the heap to the finished compost, but if the same site be used regularly, later heaps will manufacture good compost in much less time.

One important point should be observed when dealing with the first few composts. It is not wise to clean up the base of the heap too well, but leave a little ripe compost to infect the new heap with fungi and bacteria.

The most critical period of making compost occurs during the first few weeks. If the heap gets too wet or settles fast, then it should be turned at once. Fermentation is hindered and putrefaction takes place in a sodden or ill-ventilated heap. First amongst

the workers comes the fungi, next aerobic bacteria and earthworms and later anaerobic bacteria to complete the ripening process. This order must not be changed if we wish to manufacture good compost.

If these brief and simple instructions are carried out good compost can be made with a little practice. The main points to be observed are as follows:—Use as great a variety of material as is possible; mix all ingredients together, with the exception of the animal manure and lime; hard woody material is essential in all heaps, whether large or small; when hand-weeding in the garden for the purpose of obtaining a supply of green vegetable matter for the compost heap, do not shake off all the soil from the roots of the weeds, for a certain amount of soil is beneficial in all heaps. Artificial ventilation holes are either a sign of bad workmanship or lack of hard woody material. See that the right conditions prevail inside the heap and have confidence in the ability of the workers inside the heap to perform their set duties in a satisfactory manner. Make sure the heap is light and airy for the first few weeks—it will gradually consolidate as the material crumbles. Should the heap appear to settle too quickly during the first month, then turn immediately.

Experience alone will teach how to manage the moisture content inside the heap. So long as the material in the heap is uniformly moist all will be well. Do not change the position of the heap unless obvious faults have been disclosed by early operations, for only by repeated efforts of composting in a small area can the surrounding soil become impregnated by fungi, bacteria and earthworms.

Do not be tempted to overload the compost heap with nitrogenous matter, excessive combined nitrogen will be "cast off" during the period of fermentation. There is no point in exciting a high degree of fermentation for the sole purpose of rapidly decomposing the material inside the heap. The ultimate aim should be to gradually increase the amount of woody material in the heap to the point when fully fifty per cent of such-like waste can be put into the heap.

In making compost, we imitate nature as seen in the woodland, where twigs and branches form the major portion of the litter on the floor. Leaves have neither the value nor the lasting power of woody material, which alone of all waste products is capable of maintaining soil fertility.

Having spent much thought, time and labour in the manufacture of humus by means of the compost heap, its application to the garden soil should be very carefully considered if best results are to be obtained.

I see no truth in the statement so often made that compost is a substitute for farmyard manure, or that it should be used in the same manner. Except for such good crops as celery, leeks, peas, beans or similar crops grown in trenches, compost should not be buried deeper than three inches in the soil. For the majority of crops, mulching gives the best results. When the making of compost is thoroughly understood the labour necessary to produce crops is reduced by half. Compost stands alone in this respect.

Perhaps if I give some examples of the way in which I use compost I may be able to show how these are labour-saving. When a piece of land is being prepared for potatoes, compost should be spread on the surface during the winter months and can be lightly forked into the surface a few days in advance of planting the tubers. If main crop varieties are to be grown, I find that heavier yields are obtained by planting in early April and the crop is seldom attacked by blight. (Note:—The writer is referring to England, where April is in the spring.—Ed.) The reason for this is that the haulms are mature during late July and in that condition are more resistant to the spores of blight.

Main crop varieties mature early in August if planted early in April. The question of how to plant I leave to the individual. Assuming that an early

April planting has been undertaken and the crop is lifted early in August, the soil can be leveled with a rake and planted up with leeks. No compost is needed for this crop. Assuming that the crop of leeks is finished by the end of March, a light dressing of compost may be spread on the ground from which these have been lifted and shallow trenches may be taken out later for peas.

If the ground appears to be solid the bottom of the little trench may be eased up with a garden fork without turning the soil over. Cover the seeds with a mixture of compost and soil drawn from near the trench. If an early maturing type of pea is selected all pods will be gathered by the end of July. After clearing away plant residues and raking over the surface of the soil, the next crop may be short horn carrots, winter radishes, lettuces or turnips. These crops should be sown immediately after the ground is cleared of the pea crop.

A good crop to follow peas would be spring cabbages, the seed sown in July or August in a separate bed and planted out during September or October. If this crop is mulched with sawdust in November instead of using compost, few plants will be lost during the winter. I find this system of mulching with sawdust keeps land free from all annual weeds during spring and summer. If the rows of cabbages are spaced two feet apart and sawdust to a depth of about four inches applied between the rows in November, seeds of broad beans can be sown in the sawdust between the rows during March to give an early crop.

This and similar combinations of rotational crops have proved successful over a number of years. Provided a supply of compost can be maintained and used principally as a mulch or but lightly forked into the upper surface of the soil, little digging is called for. In order to ensure an adequate supply of weeds for composting, seeds of certain weeds are sown between the rows of crops.

I have mentioned that digging disrupts the unity of the soil, which in turn destroys fungal growth. Perhaps the most pleasing and spectacular results in the weed crop are to be seen where a plot of ground divided into two equal parts, the one being dug and the other left undug for a couple of years. Each year on the dug plot the weeds appear as strongly as ever no matter how carefully one proceeds to exterminate by hoeing every single weed plant before it flowers and seeds. On the other plot, however, where compost is spread out as a mulch on the vacant ground in the autumn, weed growth declines rapidly during the second year.

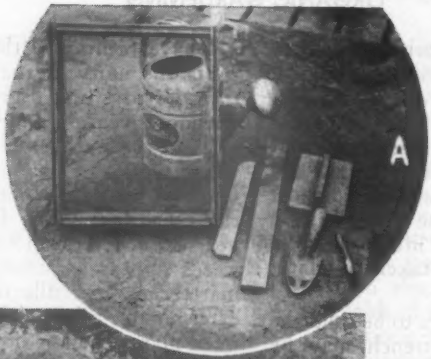
I know of no easier or cheaper method of controlling the number of annual weeds than applying compost and resisting the temptation to dig. All weed seeds which have been previously buried to a depth of three inches will germinate the first season, and providing none are allowed to flower and seed, there will only be windborne seeds to germinate the second season.

Undug soil is capable of conferring many benefits upon plant and gardener alike, of which I will deal in future articles. I have often carried this system to the stage when I have felt compelled to sow seeds of weeds along with the crop in order that the soil should be adequately aerated by the roots of plants.

In this low-lying garden I have found that digging does little to prevent water-logging of the soil after heavy rains while undug soil with its autumn covering of compost drains freely. I believe that the tunnels of the earthworms provide the best means of removing surplus surface water. I believe that regular digging often prevents the free percolation of water by the creation of a hard pan to whatever depth digging is carried out, and the loose top then becomes a sodden, pasty mess during periods of heavy rainfall which requires much drying out by sun and wind.

From soil

By RAYMOND



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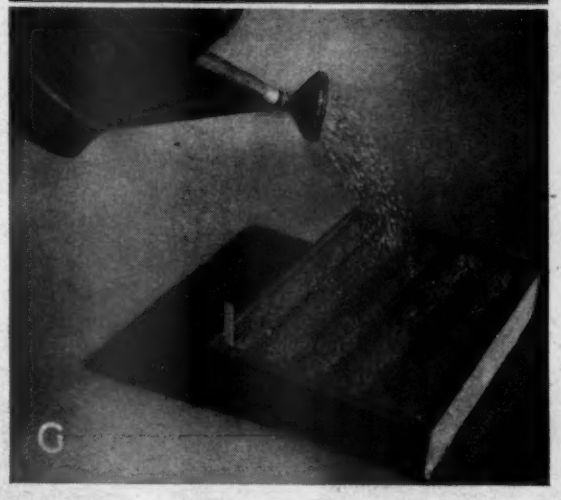
RAYMOND GREEN



have finished your study of the seed ave in your possession the seeds that g to sow this spring. It is to be hoped ery best seeds obtainable for your par- the best seeds cost so little in compar- xpenses connected with the growing of or for food that you should sow only eties. Since the seeds of poor varieties om seeds of the best varieties, you must the seedsman for honesty and reli-

sow the seeds of certain varieties of an early start. In this way it is possible ady to plant outside when the weather od here described is for flats (shallow s make it possible to do all the work of splanting in a warm, comfortable room. e grown in flats because moisture con- olled better than in other containers. Each flat should contain a uniform number of seedlings. Seeds should be sown so that each flat, of the size shown in the illustrations, contains approximately 300 seedlings. The flats with seedlings can be moved outdoors or placed in coldframes to harden off before transplanting them to the garden or field.

So many gardeners buy expensive seeds but fail to get seedlings so that they end up by buying seedlings from some commercial grower. The purpose of this article is to make clear how seedlings may be grown successfully by anyone. The illustrations show, in order, the steps involved from the preparation of the soil for the seed flats, to the transplanting of the seedlings in flats in which they will grow until they are set out in the garden or field.

The necessary planting tools include a sprinkling can with a fine-spray nozzle, flats which are 12 by 18 inches and 3 to 4 inches deep, leveling board which is 2 feet long and 2 inches wide, marking board 2 inches wide by 17½ inches long and ¾ inches thick, trowel, fine sieve, small flower pot, firming board, plant dibble made of a small branch of a tree, and small stakes or plant markers. The planting dibble shown here was made from a tree branch one-half inch thick which was cut six inches long and sharpened at one end. These planting tools are shown in *Plate A*.

Soil and leafmold for growing early plants should be collected in the fall and stored in the

basement. Occasional watering is necessary to prevent the ground from becoming too dry. The soil mixture for the flats in which the seeds are to be sown consists of equal parts of leafmold and sand, as shown in *Plate B*. The leafmold shown here was taken from the woods and contains a good supply of humus and loam soil. Mix the sand and leafmold thoroughly and then put it through a fine screen. The coarse material which does not pass through the screen can be put in the bottom of the flats. This will insure good drainage. Do not add fertilizers of any kind to this mixture. This sand-leafmold mixture will provide you with seedlings with good root systems which constitute the foundation of your plants.

Fill the flat to the top and level it off evenly with the leveling board. Do not firm the soil now, as this will make it harder to mark out the rows. Using the marking board, as shown in *Plate C*, space your rows 2 inches apart. Make the furrows about ¼ inch deep for most garden seeds. The outer rows should be about ½ inch from the edge of the flat.

You are now ready to sow the seeds, as shown in *Plate D*. Good seed must be true to name, viable (capable of germinating), free from weed seeds and other impurities, and must be the very best variety for your locality. Sow 10 to 12 seeds per inch of row. Cover the seeds with sand flowing from the drainage hole of a

Next to fertile soil rich in compost made from plant and animal residues, vigorous healthy seedlings with well-developed root systems and stocky stems with healthy leaves are the most essential requirements for a successful garden.

six-inch flower pot, as illustrated in *Plate E*. The sand must be dry so that it will run freely. Cover the hole in the bottom of the pot with your forefinger, and allow the sand to run out by carefully removing the finger from a part of the hole. In this way the rate of flow of the sand can be controlled. Hold the pot over the row, and move the pot over each row as the sand flows through just fast enough to fill each furrow. Large seeds should be covered with ½ inch of sand, while very small seeds should be covered lightly. When the seeds have been covered with the sand, tamp the top of the flat lightly, as shown in *Plate F*. Use the firming board, making sure that the surface of the soil is kept even and level. Do not forget to tamp the corners of the flat. All planted flats should be properly labeled with name of seeds planted and date of planting.

When a flat has been planted and tamped, it should be watered with a sprinkling can which is fitted with a nozzle for breaking the water up into a fine spray, as shown in *Plate G*. Allow the water to soak in, then sprinkle again. Covering flats with glass or newspaper will prevent drying out and will hasten germination.

The number of seeds that you may expect from an ounce of seeds are about as follows:

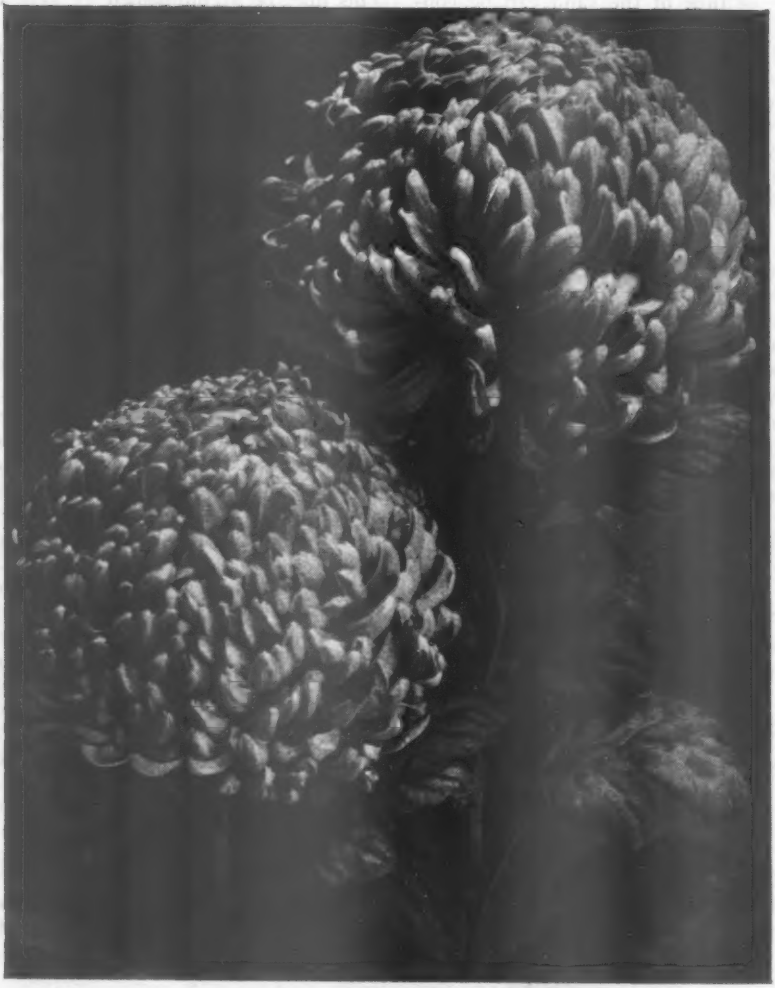
Kind of seeds	*Number of seedlings*
Tomatoes	2000
Peppers	1000
Lettuce	3000
Celery	8000
Cabbage	2000

Ordinary seed packets which you buy from seedsmen will yield from 100 to 150 seedlings.

Seedlings should be transplanted just as soon as the first true leaves appear. The first leaves of a seedling are called cotyledons or seed leaves. Care must be taken that the roots are not injured when the seedlings are removed from the flat for transplanting. This may be accomplished by loosening the soil around and beneath the seedlings with a plant dibble, as shown in *Plate H*. If the seedlings are transplanted with a considerable amount of soil adhering to the roots, their growth will be retarded little or not at all. Plants with weak or broken roots should be discarded.

The soil mixture recommended for transplanting consists of 1 part sand, 1 part of good compost, and 2 parts of leafmold, as illustrated in *Plate J*. This mixture should be fairly moist. Fill the flats and tamp firmly. In setting the seedlings, make holes in the soil mixture with your finger or with a plant dibble. Spread the roots carefully, cover them with the soil, and firm the soil over the roots and around the stems. The seedlings should be watered at least 24 hours before transplanting so that the soil is moist but the tops of the plants are dry. A flat 12 inches by 18 inches will accommodate approximately 100 seedlings. Water the seedlings lightly after transplanting. The flats should be placed where the conditions for growth are optimum. Keep the temperature down and the light bright. The growing plants should be inspected every day and watered as often as necessary. Watering should be done in the morning so that the foliage will be dry at night *Plate K*. Proper temperature, moisture, and ventilation will insure for you a healthy crop of seedlings to transplant to your garden bed or field.

The Fruit Orchard, 25 cents. **Sunflower Seed—The Miracle Food,** 25 cents. Order from Organic Gardening, Dept. Z-1, Emmaus, Pa.



QUEEN OF YOUR FALL GARDEN.

A GARDEN SEMINAR

WITH OUR READERS

Exhibition Chrysanthemums

by Betty Otter Evans
—Towson Garden Club

Very few people seem to realize that one can grow big exhibition chrysanthemums almost as easily as any other variety. While I love all chrysanthemums I do think the large ones make a more delightful border, and literally give bigger rewards for the time spent with them. Try them in crescent-shaped borders and see how people stop and admire them.

At the end of this article I'll give the names of some large varieties that usually bloom before frost. We will think first of the work to be done in the spring and summer. Our earliest job is ordering the plants. If you decide you want 30 chrysanthemum plants by fall, you should order roughly a dozen plants to be delivered to you by the end of April or May depending on the section of the country in which you live. Although mums do not freeze easily, do not worry if you think they have arrived before the weather outdoors is warm enough for them. Just plant them in pots or boxes and place them in a cool, sunny window for the time being. In fact, I think it is always a good idea to plant one or two in pots anyway. These pots, enriched with compost and heavily mulched with grass clippings, can be plunged in the ground later. Although they will dry out and probably need a daily watering in pots, the compost will help keep the soil uniformily moist. Do try to save some compost to put on the soil and around your flowers as well as your vegetables. If you have no compost left, mix some well-rotted manure with the soil in your garden bed.

When you set your mum plants outdoors, place your original plants at the back of the border, spaced about 8 by 8 inches. These will grow to be your tallest plants, and may need staking later. Now then, as soon as your original plants have grown a few inches or are 6 or more inches tall, you can take cuttings from them and thus grow your own second crop of plants. With a sharp knife, a scissors, or even your thumb or finger cut off the top few inches. This will hurt at first but remember that two shoots (branches) will grow below every cut you make. A slanting cut is preferable.

You now have twelve little cuttings of which perhaps ten should become new plants. For a rooting medium, sand is best. You can buy a bag of builder's sharp sand quite reasonably at most lumber yards. A big container is best to use as it does not dry out as quickly as smaller ones. I use a large tin measuring 36 by 18 inches. However, any old dishpan or wash tub will do as well. Take only the bottom leaves off the cuttings and insert in the sand. Keep the sand moist but not soggy at all times. Spraying with a rubber syringe is very helpful. If you prefer, you can put the cuttings directly in soil in some plant bands made of wood veneer. The only

Mums for Your Own Garden.

trouble is that these will dry out much quicker. Place the containers where they get full light all day long with little or no sun. The north side of the house works well.

If the weather is warm you will be surprised how quickly new little roots will form. When the roots are one half to one inch long, you are ready to plant the cuttings in your border. Put them right in front of your back row of plants. Probably they will be shorter than the original ones but will blossom almost the same time. You should now have approximately twenty plants. Try to pick a cloudy or rainy day to transplant them, and if and when the sun does come out, shade the plants a few days until the roots have developed sufficiently to absorb water from the soil. Incidentally I would add that if you have any extra plants not needed in your particular border that you plant them elsewhere in your garden for the summer. Then, when blooming time arrives and you find a dog or child has broken off a plant, you can dig up one of these extra plants and place it in your favorite border in place of the broken one. If enough moist soil is taken with the roots you will find, surprisingly perhaps, that mums can be transplanted anytime in the summer or fall without injury even when they are in full bloom. This also applies to bringing them into a sunroom or a window on the day before a heavy frost is expected. While a light frost will rarely damage tight buds, the opened flower heads may be destroyed by the frost.

Now to go back to the border of chrysanthemums you are making. If you look at the plants in the back row, that is, the row having the original plants which you bought, you will find that out of each stalk, just below the place where you made the cutting, two new shoots are growing. These new shoots will make your original plant have two long stems on which to bear fall flowers. You can let them grow or you can again pinch them off when they are several inches tall and thus cause four stems to be grown from each plant. As before, the cuttings can be rooted in sand. Since the weather, by now, is probably quite warm, they will root faster than the first cuttings. Be sure though not to do any pinching after July 1 or so. After the roots are formed you can again put the rooted cuttings in your border, this time in the front row. Now you have three rows and about thirty plants altogether.

Your next decision will come later in the summer. Then you must decide whether you want one large flower on the end of each stem or whether you will just let all the buds develop naturally and form a lovely cluster or spray of medium sized chrysanthemums. My advice is "a little of each." Then you can see how beautiful the blooms are when all the strength of the plant goes into 2 (or 4) blooms and also how attractive a spray can be with all the buds left intact. I cannot tell you exactly when the first buds will appear. Naturally an early bloomer will set buds before a late bloomer. Do not be discouraged if the plant is

small; the buds will appear about the same time no matter if the stem is short or tall, because all chrysanthemums set their buds according to the length of the day, or, I might say, according to the number of daylight hours. It is what plant physiologists call a short-day plant. A florist can bring his chrysanthemums into bloom at any time by controlling the number of daylight hours. This is done by using dark cloth over the plants or otherwise exclusing the light. When he puts a black cloth over the plants every day at a certain hour, the plant thinks the days are shorter than they really are of course, and so it produces buds and flowers. Once the buds are there, the warmth and moisture determine, to a certain extent, the date for the flower to open.

To return to the subject of removing buds (called disbudding by florists) wait until the buds are large enough to really see them. There will be one in the middle and little ones clustered around it. With your thumb and finger remove all the buds which you do not wish to develop. This may make you feel badly, but think in terms of the future larger blooms.

Last but not least, I'll give a list of a few large mums in each color class that should bloom before frost in the Middle Atlantic States.

YELLOW

Name	Color	Size	Date of flowering
Gold Lode	Light yellow	Medium	October 3
Mrs. H. E. Kidder	Deep yellow	Large	October 20
Yellow Ambassador	Lemon yellow	Large	October 20
Sun Glow	Golden yellow	Large	October 25
Apricot yellow	Apricot	Large	November 1

PINK OR LAVENDER

Pink Chief		Medium	October 15
Major Bowes		Medium	October 20
October Rose		Medium	October 20

WHITE

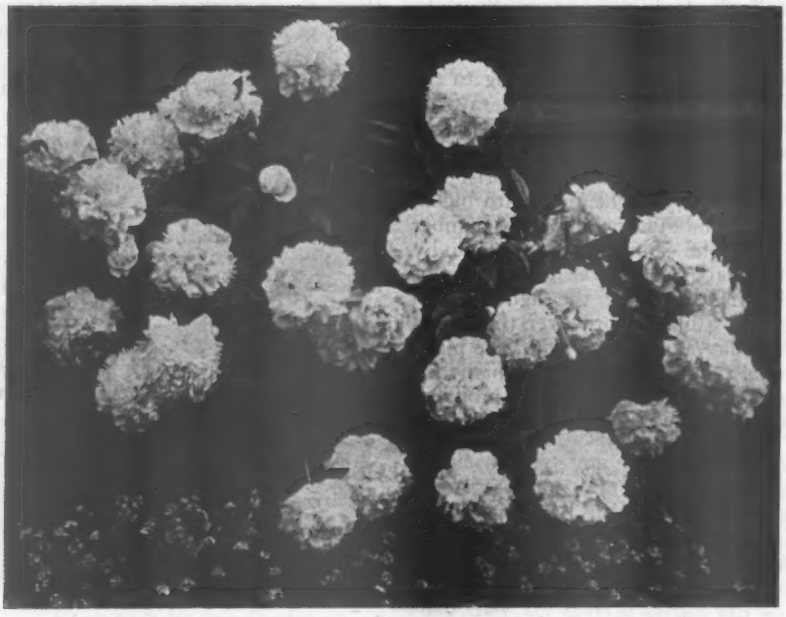
Smith's Early White		Medium	October 15
Silver Sheen		Medium	October 18
Ambassador		Large	October 20
Albatross		Large	Late October
Betsy Ross		Large	Late October

Armeria As A Border

by Edward Skultin

Most readers of the *Organic Gardening Magazine* don't have to be told about the advantages of compost, earthworms, and the other related items pertaining to organiculture, and the foolish and thoughtless practices in use by a great majority of people who depend only on the commercial fertilizers and cure-alls for their flowers and vegetables.

I am very happy to have come across the "healthier way" of growing things. The funny part was that I was never actually on either extreme end,



ARMERIA EFFECTIVELY BORDERING PEONY

but right smack in the middle. Six years ago, and all the years previous to that, my mother was the flower grower. I wasn't allowed to touch them, so when she passed away, I really started from scratch. I remodelled the whole yard, which is just an average size, and began to learn things fast. I haven't for one minute lost interest in my "outdoor hobby," and the winter months are just so much misery to me. From the time I put my garden tools away, I almost count the days when I'll be outside again. And since I've been reading everything I could get hold of pertaining to organiculture, my interest has increased to a curious sort of excitement. To revert to my previous statement of being in the middle, by this I meant that in the last six years, I haven't tossed out one single bushel of waste green material, although I didn't know anything about compost. That was a mysterious word to me. I merely buried everything, and even that system was showing results. I never did use too much chemical fertilizer, but just a sprinkling around my plants, and ammonium sulphate on my creeping bent lawn.

Once in a while I would damage something, like the lawn, which would burn out in spots. But I never dreamed of the high value of earthworms, and couldn't see how I was actually making it harder each year to maintain my lawn, and here is one point of proof in *disfavor* of such things as ammonium sulphate, etc. I never used as much of the stuff in the backyard, as I did in the front, because I wanted to be sure of having a better lawn in the front, but the results I was getting were exactly opposite to my wishes. I never used these commercial fertilizers in hot weather, but as early in the spring as possible, so let no skeptic say that there was the reason my lawn burned out. The grass would be "fed" early in the spring, and would grow luxuriantly for about

three months, and then, downhill it would go at an alarming rate, until by fall I'd be lucky to have half the lawn still there, while, get this, please, although my backyard creeping bent was almost neglected in comparison to the other one, it would stay green all year! And to this let me add that actual proof can be shown of the goodness of earthworms. My front yard hardly shows any earthworm castings in the summer, because I quite ignorantly killed them, while the backyard has plenty. On a warm wet night, after a rain, my backyard is literally crawling with the little animals.

But all this was not the main theme of what I have sat down to tell.

I have a certain plant in my yard, which I use for a border, and which, the very few times I see advertised in seed catalogs, is mentioned as a rock plant. It was left to me by my mother, and one of the first jobs I had to do in my remodelling of the yard was to incorporate this plant as a border all around my yard, separating the lawn from a four foot flower bed which skirts the whole yard, except for the driveway. This plant, which I prize very highly, is called *armeria.* I have seen very little of this for sale at plant counters in the spring. In fact, all I saw last year was a peck basket of the stuff, and my wife saw a little of it in a dime store, a clump small enough to conceal in a closed fist, and the price was 29c.

Mine has multiplied to the point that if I had to move it, four dozen bushel baskets would probably be needed. This border in its full glory is more than a foot wide in most places, grows only about four inches above the grass level, and when not in flower, looks like a ridge of dark green grass, a tiny hedge.

Many people have asked me what that stuff was. Was it a flower or grass? Then I'd have to explain that in the spring the whole border would be covered with tiny pink buds which begin right in the heart of each little plant, or rosette, and as the stems grow, the flowers open up, and are in their full glory when the stems have reached a height of five or six inches.

And now I come to the main point and reason for writing this little piece. I had always admired my armeria border for its hardiness. It is very hardy, and I thought it had a very unusual capacity for withstanding droughts. The only damage the border has ever suffered, and that only in spots, was from an occasional dog, or an ant hill, and incidentally, in this case, I found that cyanogas killed the ants all right, but also the armeria in the immediate area where it was used. My real awakening to the reason for the healthy appearance, and disease and drought resistance of the armeria, the way I have it planted, came only when I began reading about earthworms, and earthworm castings, and the importance of the castings in relation to the minerals they contain, and the value of these to all plant life. Here, then, for all doubting Thomases, is the answer: I never, in six years, used one drop or ounce of fertilizer of any kind on the armeria, and the little bit, pinches that is, of any commercial fertilizers I used on the flower bed couldn't possibly have reached the armeria. But anytime during the summer, even in the hottest and driest weather, just pick up the armeria anywhere along the edge, and peek underneath. Do you know what you'll see? You'll see the armeria anchored to the ground, but not on the ground level as I had planted it six years ago, but anchored and resting on a continuous pillow of three or four inches high, of nothing but pure earthworm castings. Have I said enough?

(Editor's Note:—Armeria is a former name of the genus Statice, a genus of dwarf perennial plants of the Leadwort Family. This plant is commonly known as Sea-pink, or Thrift, and is used in rock gardens and as edgings for beds or borders.)

Miracle In My Garden

by Mrs. Lulu Mae Hamilton

I had never heard of compost until I subscribed to *Organic Gardening*. A young veteran convinced me it was a magazine I should have at hand, since we have on our place all the natural resources for making compost at its best. My order was placed so late in the spring, I had no time in which to make compost, after I finally did receive directions in "Compost—How To Make It." However I read each line feverishly, for I recognized at once we'd been on the wrong track.

The first day this booklet arrived I walked around in a daze. I was eager to get started. What to do. I needed it right then.

It was then I remembered an old trash heap, out of which was growing some very rank weeds. This pile was about four feet high. I knew the gardener had thrown all kinds of vegetable waste on this pile, also hay, manure, and sweepings from the barn—so when no one was looking I took a shovel and cut down into it. It was dark, rich and wonderful to handle—I was so excited. Could this be "compost," and no one taking advantage of its worth.

I decided to tell no one what I planned to do—I wanted to be sure I was right, first, but I was going to do a little experimenting on my own. I settled on a rose bush which was practically dead. I was going to give this material a real try. Each year this rare old bush would bloom early, but before the blossoms were full blown, the green worms would start to work on it, and before we'd realize it, the whole structure would be a brown lacy network. This, after our using every known chemical to prevent it. These green worms became confirmed addicts to nicotine from the *black leaf* 40.

This year I thought the bush was completely dead. I dug deeply around its roots, until they were all exposed. I feared it would topple over, so I braced it with boards while I packed this rich compost all around the large and small roots. I soaked it with water, and placed the old soil over the top so no one would suspect anything. Each day for several days I poured a bucket of water over the roots, and proceeded to forget the whole affair—I thought it might live through till spring, then I'd treat it again. But a miracle was performed. In three months from that treatment I was rewarded with its revival. It was more gorgeous than any rose bush I have ever seen. I counted thirty full-blown luscious pink roses. Their color was of a deep watermelon pink, and continued to bloom till frost. This it had never done in all the *twenty-five* years of its previous life.

Then I transplanted some *English Daisies* in this material. They'd never done well. I was about to give up the idea of raising them. They took heart after the first treatment, and if I hadn't known they were actually the scrawny plants I'd put out, I'd have sworn they were lettuce or young cabbage plants they were so large and green.

Me for *Organic Gardening*. You should see my two "real" compost heaps this year!

Editor's Note—*We are highly pleased with the interest our readers are showing in the Garden Seminar. Every day we receive one or more articles which are worth publishing in any garden magazine. We want to share as many of these articles as possible with our readers. If you have not already taken an active part in this seminar, please do so before you become too occupied with your garden later in the spring.*

QUEEN OF YOUR SPRING GARDEN.

A New Book for the Gardener . . .

The Earth's Face and Human Destiny

by EHRENFRIED E. PFEIFFER (Rodale Press, Emmaus, Pa. 1948)

Dr. Ehrenfried Pfeiffer, a disciple of Rudolph Steiner and now the leading exponent of the Bio-Dynamic method of farming and gardening, is peculiarly fitted to treat so vast an educational subject. He is a biologist and agriculturist of international reputation well qualified to treat with matters pertaining to the soil in relation to beautiful landscapes, a prosperous and permanent system of agriculture, and a healthy people.

The author masterfully portrays the landscapes of the earth as the resultant of natural forces. These are healthy or diseased depending upon whether the laws of Nature have been permitted to operate or have been thwarted by interference on the part of man. A healthy landscape maintains stability and the highest possible state of fertility, and all forms of plant and animal life contribute to a harmonious expression not unlike that of the musical instruments which join in the rendition of a great symphony. If Nature's rhythms are broken and too little regard is given to the value of such features of the earth's face as forests and woodlands, prairies, marshes, meadows, and plains, the consequences may be devastation and death on a wide front. We need only recall the diseased landscapes of Mesopotamia, Northern Africa, and the dust bowls of the United States not so many years ago.

Natural landscapes are, as a rule, biologically sound and truly beautiful. It is man's responsibility to keep them beautiful. Dr. Pfeiffer indicates clearly and forcefully the intimate relationships between the physical and biological make-up of a region and its human inhabitants. Man takes his sustenance from the landscape and he is as much its product physically and spiritually as though he had been fashioned in a mold. Such parts of the earth's face as the sea and the tropical jungle which are unconquerable by man continue indefinitely in their pristine beauty. The author warns of the dangers that are sure to attend bad cultural practices in reshaping such parts of the landscape as come under the domination of man. The most plastic factor in the landscape is the vegetation or plant cover. It is at this point that human beings

can most easily intervene in the picture in a health-giving or disease-producing manner.

Dr. Pfeiffer analyses and discusses, in turn, the problems of the plain, the problems of the mountain, the problems of the woods, and the inpacts of urban civilization and industry on the landscape. In reading this book one is impressed with the author's ardent love of nature and his deep understanding of her laws. It should be read by all agriculturists and by all who go to the meadows, woodlands, and forests for pleasure or for rest of body or mind.

This book is clearly written in concise terms, and is illustrated with 61 well chosen examples of various kinds of landscapes so that the author's conclusions are realistically portrayed. The author's language is simple and so clearly expressed that the reader gets the impression of passing from one beautiful landscape to another. Here is an example of the author's descriptive language, "The harmoniously arranged, cultivated landscape, which does not sin against any biological law of Nature, belongs among the natural landscapes we have been describing." And again, "The flooded rice fields, ringed with hillocky elevations and planted with tea and other shrubs, take on the character of a garden landscape accented by many human beings." It is most interesting to follow the author in his transitions from natural landscapes to artificial ones which have been fashioned into pastures, meadows, orchards, woodlots, forests which have been destroyed and now happily are being reclaimed, and urban and industrial landscapes. Some landscapes are fixed and permanently beautiful, some are undergoing change, while others have passed away and now are replaced by desolate wastes—unhealing sores in the earth's face.

Dr. Pfeiffer has much to tell all persons who are in any way interested in or concerned with planning. His book has much to offer to all interested in the conservation of our soils, our wild life, and our national health. It should have a special appeal to our youth who will be laying the foundations of a new peace-loving world based upon mutual understandings.

The Earth's Face and Human Destiny is published by the Rodale Press and can be ordered from Organic Gardening, Emmaus, Pa. The price of this cloth bound and beautifully illustrated book is only $2.75.

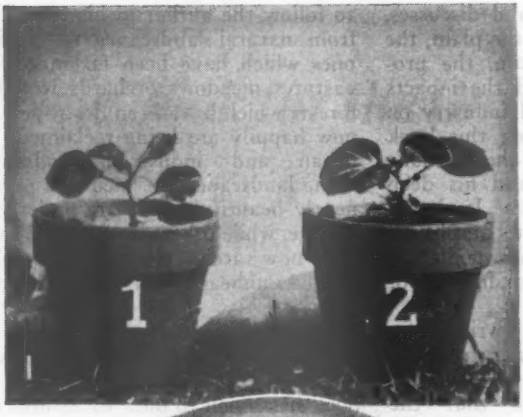
William H. Eyster, Ph.D.

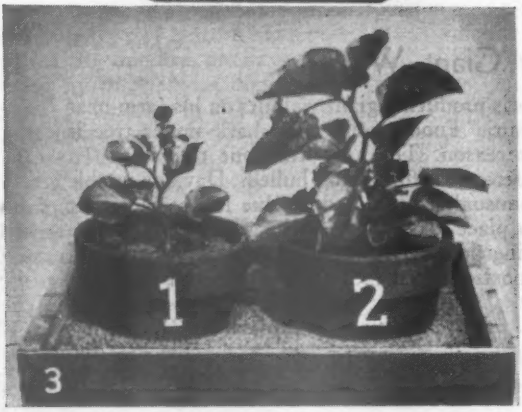
Mystery in Giant Walnuts

W. C. Davis is producing giant walnuts on his farm near Stockton, Missouri. Food provided by bark under tree is owner's guess at reason. The nuts from one tree were ten inches in circumference before being hulled. Davis is unable to explain the unusual size unless it is due to the fact that employees on his place for years used the ground around the tree for sharpening posts. His opinion is that the bark and chips from the posts filtered into the ground and provided food for the tree.

Kansas City Star, November 21, 1947.

Earthworm Castings and Hous





by L. C. LEMMON

For several years it has been my hobby to raise earthworms and collect their castings. These castings, I have used in my garden about my choicest plants. I have found them very successful as a medium in which to grow potted plants in the house where air and sunlight are not always at best.

I became interested in knowing just how much credit was to be attributed to castings, all other things being equal, for the excellent vigor of my potted plants.

The best way to learn the answer to this question was to run a controlled experiment. At that time I had two flats of cuttings from Begonia semperflorens, the Wax Begonia so popular with indoor gardeners because of its continuous blooming habit. These

Calendar

1. *July 26—After 20 days, No. 2 is ahead.*
2. *August 6—One month after potting.*
3. *August 16—No. 1 has one flower, No. 2 has eight flowers.*
4. *August 23—No. 2 is twice the size of No. 1*
5. *August 31—No. 2 shows strength and vigor from earthworm castings.*
6. *September 9—No. 2 is five times as large and has ten times as many flowers.*

Plants

cuttings were ready for potting and since I had nearly forty of uniform size to select from, it was easy enough to choose a matched pair.

The first step in this experiment was to prepare two six inch pots to receive the matched cuttings. Into the bottom of each pot were placed some pieces of broken crock, which were then covered with a layer of Sphagnum moss and this in turn by a thin layer of clean sand. This I have found to be an excellent means of drainage for potted plants.

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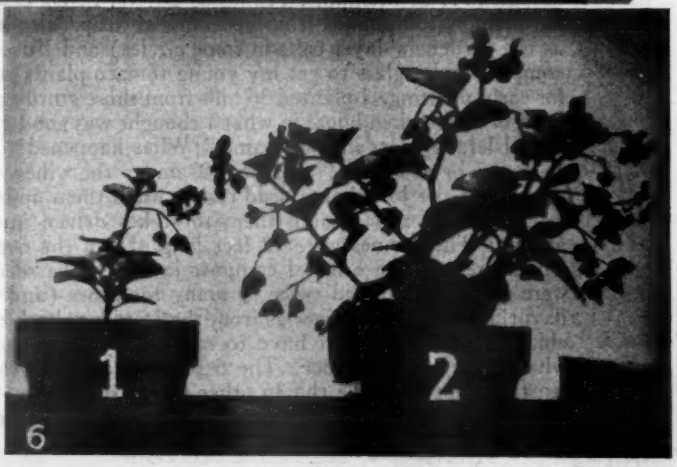

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This drainage material takes a little less than two inches of the pot's depth in these large pots, thus leaving about four and a half inches which should be filled with the soil in which the plant is to grow.

Pot number one was to be my control so it was filled with local topsoil while pot number two was filled with earthworm castings. The matched cuttings were planted and watered and since the experiment was to be conducted out of doors both pots were set into three inches of moist sand in a deep flat. This was done to insure that in case of neglect there would be little danger of the pots drying out. This arrangement made certain that both plants got the same amount of sunlight and shade as well as identical conditions of air and humidity.

This flat with my two begonias was placed in semi-shade, where, I have found, these plants do their best out of doors. Twenty days after they were potted the number two begonia began to show signs of outstripping its mate. Seeing this, I determined to get a picture story of these two plants if, as it seemed, one was about to unfold. A story did unfold which, I believe, will interest other organic gardeners and especially those whose hobby it is to grow house plants during the winter months. If the reader will please forgive the unprofessional aspects of this story, it will enable him to follow week by week the difference soil makes in the life of a plant, all other things being equal.

By the end of the second month begonia No. 1 consisted of one stem about seven inches tall with two small bloom clusters while begonia No. 2 had five large stems each about a foot long with nineteen large bloom clusters.

Although I use nothing but earthworm castings for my potted plants as I have found them to be the best food, it took this experiment to show me just how much better they were than our best local topsoil.

Gardeners' Layer Cake

In 1941 at Memphis, Tennessee Dr. W. C. Dickey gave me perhaps 100 pounds from his compost heap (also known as the gardeners' layer cake in some circles) and I used this compost under glass to get my young tomato plants started for early planting. I planted 36 hills from those sturdy plants back of the chicken house in what I thought was good garden soil. I left 6 plants in the "frame." What happened? I had to run 3 or 4 sticks 2" x 2" x 10' under the vines which started for the Jones' on a dead run. I lifted them up off the ground 2 feet and secured them to stakes driven into the ground. These vines were 12 feet long. From the 6 plants which grew in the original compost in which the seedlings were grown I gathered twice as many tomatoes (and what flavor!) from these 6 vines as from the 36 plants back of the chicken house. I didn't have to call in anyone to tell me what made the difference. The 6 plants were set before a feast (compost) while the 36 other plants starved.

A. W. P. Rogers, Granbury, Texas.

Sea-Weed Compost . . . .

By HOWARD G. LASKEY, M.D.

SEA-WEED and manure, provide the basis for the most completely balanced compost known. For sea-weeds contain the common elements, and the uncommon trace elements, which the plants have received from the inexhaustible sea. In perfect balance, Nature's formative forces build the sea-plants into extraordinary complex colloid forms. The ejecta of domestic animals compliment this, with wonder-working hormones drained from every cell of the animal body.

For any land, especially inland areas, where even the vitalizing sea-fogs cannot penetrate, this kind of compost is of inestimable benefit. No possible combination of chemicals can approximate the living effect of this wonder-working material. No bag of chemicals can exert the healthful, life-maintaining, and integrating force of this compost on the land. We can in wisdom use it. But, with the wisdom of modern science, we cannot yet understand its perfect balance in Nature. We can only see its good effects.

The higher life-forms—those of the sea-plants and the ejecta of the animals, yield their substance to the tiny microorganisms of the earth's crust. These tiny organisms live out their lives in working on this material which in turn they pass to the plants. The plants provide the food for animals and Man. Thereby the perfect rhythm is maintained in the wheel of life. The introduction of chemical-fertilizers into this cycle produces eccentric rhythms and disorders.

Scientists today, begin to understand the indispensible role of "trace-elements" in Nature. Dr. Pfeiffer's articles in *Organic Gardening* show some of the functions of boron, manganese, etc. These important discoveries are in the making. While we wait for science to rationalize why we do it, there is nothing to prevent us from using the sea-weed that contains them all in balance, in living use.

Dr. Rudolph Steiner discovered that hydrogen plays an important and complex role in the life of the plant. Hydrogen increases the "awareness" of the plant to its environment. The plant becomes more vigorous, more "alive." This is modern thinking, the implications of which open up vast vistas into the future. In the sense in which we observe plant-life, as composters, we see that life-functions may be grasped only with poetic imagery based on reality. Composters deal in Life-dynamics. The chemists deal with a test tube concept of life that is unreal and very dead. These are the basic premises to an understanding of sea-weed compost!

Pelladium, a 4th Century Roman, recommended sea-weed on the land. Further he suggested that it first be washed with fresh water to remove the salt. Some agricultural chemists recommended this washing also. The chemists found that in the test tube observation, salt, impeded the action of plant carbohydrates. At any rate, none seemed to think it wise to try this on the fields without a bath. We tried it without a bath; and, it works perfectly. We have tried it for seven

years. In fact, if sea-weed is washed before placing it in the compost-pile, it will lose, to some extent, certain elements, by leaching.

In 1885, Rhode Island used $65,004 worth of sea-weed, as against $164,133 for chemicals. As Liebig's concepts gained adherents, less sea-weed and manure were used. Finally the famous Rhode Island Greening apple disappeared, the flint-corn deteriorated, flax disappeared, and the once fine farms were abandoned. Weed-trees filled the fields. Nature literally threw the prodigals off the land. Men left Eden for the factories.

Winter storms visit the coast during the late winter months. Vast quantities of sea-weed are thrown up on the nearby beaches. Horses and oxen pull the drag-lines laden with sea-weed up on the beaches, above the tide levels. The owner of the pile sells it, usually, for $1.00 a ton, average, on the spot. It is trucked away for compost. Since sea-weed does not freeze readily it is easily pitched into trucks from the piles.

The sea-weed contains a wealth of marine-life. Shells of bivalves, small fish, crabs, and starfish make up part of the load. The sea-weed when fresh shows great variety in forms and delicate coloring.

Here, the sea-weed consists of the long flat ribbon-weed, broad ribbon-weed, dulse, rockweed, Irish-moss and kelps. From Irish-moss we make a delicate and tasty-pudding that looks like and tastes like a custard. Bacteriologists make a nutrient medium from Irish-moss (Agar) on which they grow certain cultures. This moss provides an excellent medium for those beneficial organisms to grow in, found in a compost-heap. Those that kill pathogenic, or harmful organisms, use the Irish-moss as a culture medium in which to grow. Thereby a compost is produced that is free of pathogens, such as B. coli.

Analysis shows that the star-fish body contains 20.3% minerals and the king-crab body 12.55% nitrogen.

About 40 years ago the Rhode Island Agriculture Experiment Station published an analysis of local sea-weed. It was a very well-done piece of work. It was done under the impetus of the fact that old-time local agriculturists used it with great success. The study involved an analysis at various seasons of the year, of each of the sea-weed forms found here. There was some slight variation of the commoner elements in different types of plants. The seasonal variations showed higher values for sea-weed collected after winter-storms, and lower values for those in summer. This was accounted for by observation that summer-collected sea-weed had undergone some oxidation due to strong sunlight, wind, and water action. At the time of this study nothing was known of the function and importance of trace elements. Therefore no report was made on the trace elements, such as manganese, cobalt, boron, titanium, etc.

An aggregate analysis for the winter months showed the sea-weed to have the following composition:

ELEMENT	PERCENT
Water	64.24
Nitrogen	1.25
Phosphoric Acid	.14
Potash	.82
Lime	5.57
Magnesia	.72
Insoluble Matter	2.58

At first glance this analysis seems to be low in certain values for such crops as potatoes and corn. Paradoxically, from a laboratory point of view, it produces bumper crops of corn and potatoes, as well as other crops. It is axiomatic, with those composters who are scientists, that, in dealing with living things, the whole is greater than the sum-total of its component parts.

Although by training I am a physician, with some knowledge of biological chemistry, I find it only more or less useful as a point of departure in explaining these matters. I let the earth tell me what it needs when I walk across my fields instead of the

test tube. It always works better to do it that way. After farming for a while you become aware that a field needs, let us say legumes, without consulting your books to find out what had grown there for the past two years. This is the "green-thumb" element that should enter the consciousness of all of us composters.

Many of you have small vegetable gardens. To you, it may be suggested, that wherever possible you make a visit to the coast. Collect about four bushels of sea-weed, and add it to your compost heap. This amount will take care of the needs for trace elements for an acre of land, for three years.

If sea-weed compost could be introduced into Switzerland, there would be less goitre (Colloid Adenoma of the Thyroid). The same is true of other inland regions. It may well be that certain, so-called degenerative diseases, which are becoming more prevalent, such as Multiple Sclerosis, Myasthenia Gravis, and certain forms of mental disease, may be engendered by soil-unbalances, produced by chemical-fertilizers, and chemical food-processing, as bleached white-bread. I am convinced that all mental diseases have as their cause physical diseases. I am equally convinced that the physical diseases that cause the phenomena of abberrant mental-health may have their genesis in soil-depletion. It would be well worth while to correct the obviously incorrect postulates of many agricultural chemists, if for no other reason than that it is usually poor chemistry, and usually does not, to any vital extent, consider the soil microbiological life. The bacteriologists have been kept out of the field of agronomy for too long a time.

For these reasons, those trace elements derived from plant-life and manures (including urine) are far better for agriculture than inorganic minerals. Traditional agriculture is a caricature of what it should be. Old automobile bodies are dissolved in vats of sulphuric acid. The solute is diluted with water and poured on the iron-hungry commercial pineapple fields. Borax is used for heart-rot in beets. Epsom-salts (magnesium sulphate) is given to the land. These ridiculous measures may be obviated with sea-weed compost, and at less expense.

The entire art of compost-farming consists of becoming aware of the subtle things. One who lays his hand to the healing of the sick Earth, even within the compass of a backyard garden, will experience its living validity.

Schedule of Spring Flower Shows

DATE	SPONSORING ORGANIZATION	PLACE
Feb. 28-Mar. 6	Home and Garden Show, Public Auditorium	Cleveland, O.
Mar. 8-13	Horticultural Society of New York and New York Florists' Club, Grand Central Palace	New York, N. Y.
Mar. 8-13	Philadelphia Flower Show, Inc., and Pennsylvania Horticultural Society, Commercial Museum	Philadelphia, Pa.
Mar. 9-14	Flower Show Association, Kiel Auditorium	St. Louis, Mo.
Mar. 13-21	Michigan Flower and Garden Exhibition, Convention Hall	Detroit, Mich.
Mar. 14-21	Society of American Florists, Coliseum	Chicago, Ill.
Mar. 15-20	Massachusetts Horticultural Society, Mechanics Building	Boston, Mass.
Apr. 27-May 2	California Spring Garden Show, Exposition Building	Oakland, Calif.

GARDEN PEAS

by W. T. TAPLEY, Geneva

FROM a total of 58 varieties of canning and freezing peas grown in the 1947 trials at the Experiment Station at Geneva, eight new varieties showed considerable promise. For the trial, four replicas of 100 seeds of each variety were planted in 16-foot rows, three feet apart. Because of the late spring and wet cold weather, planting was delayed until May 13, and the resulting germination and growth were adversely influenced by continued poor growing conditions for peas. Comparative records were obtained which when added to observations in previous and future years will enable a better evaluation of these varieties.

In the illustration, typical pod specimens are shown at canning or freezing stages of maturity. The pods were harvested, frozen, and later assembled to show comparative size and shape of pods and peas.

CANNING VARIETIES

COMMANDO matured two days later than Canner King. The plants averaged 6 inches shorter, with strong vigorous growth. The variety is outstanding in the number of double pods, averaging three doubles per plant. The pods are slightly shorter than those of Canner King, with fewer peas per pod. Although Commando matured with the late varieties, the vines remained greener without showing adverse effects of heat.

Surpass matured at the same time as Surprise and in many respects was similar to that variety. Plants showed slightly more vigorous growth, but pods were slightly shorter, with fewer peas per pod.

Bonneville showed high yielding

for Canning and Freezing

Reprinted from Farm Research

ability with a high percentage of double pods. The vines are vigorous, growing 25 inches in height. In total number of pods per plant and in the number of double pods per 100 plants, this variety was ranked only by Commando and Wyola.

Freezing Varieties

Cody was the earliest of the large-seeded varieties, harvested the same day as Thomas Laxton. The tenderometer reading was 112 compared with 104 for Laxton. The pods and vines are a lighter green than Laxton, resembling World Record in this respect. The pods are slightly smaller but of the puff pod type, with fewer peas per pod. The berry is relatively large and if the variety meets processing requirements it may make a place in the variety list.

Wyola has been grown in the trials at Geneva for several years and has shown high yielding ability. It was harvested six days after Thomas Laxton, two days previous to Alderman, and had a tenderometer reading of 97. The pods are similar in length to Perfection, but contain less peas per pod. The berries are smaller than those of Perfection, but the high percentage of doubleness results in comparatively high yields. The vines are strong growing and average about 28 inches in height, slightly taller than Perfection.

Freezonian, Victory Freezer, and Dark Green Perfection also showed considerable promise in the medium to late season varieties. Freezonian produced no double pods, but the pods averaged longer with fewer but larger berries than those of Victory Freezer.

Garden Calendar—March

THE NORTH AND EAST

March weather is a mixture of sunny and cloudy days, spring sunshine and winter snows, and thawing and freezing. It is time to begin removing the coarser parts of the mulch from the early spring-blooming plants, while the finer parts should be left on the soil to feed the soil organisms.

The Lawn:—Fill in the low places in the lawn during the days of freezing and thawing which will help settle the soil. Roll the lawn but not when the soil is wet, especially if you have a clay base soil. A good time to roll is when the soil is honey-combed by a late frost. Moss in the lawn is a good sign that the soil is deficient in nutrients. Give it a liberal dressing of finely screened compost.

Coldframes:—Get your coldframes ready for seeding. If you have none, try making one this year. Plant in the coldframe the seedlings you started in the house. For best germination, sow your seeds in a mixture made up of equal parts of compost and sand, and cover the seeds lightly with sand. For germination, keep temperature at about 75 degrees F., for seedling growth after germination, keep temperature lower (60 degrees F.) but the light bright. Sow the seeds of half-hardy annuals in the coldframe.

Flower Garden:—Set out pansies as soon as the ground is ready. Cuttings of chrysanthemums and other kinds of flowers should be made this month. Plant sweet peas not later than the middle of the month, preferably in a trench prepared last fall. Cannas to be grown from seed should be started in March. In your bulb beds plant violets, Arabis, Siberian wallflowers, and early blue phlox to hide the yellowing leaves of the bulbous plants later in the spring.

Shrubs and Trees:—Roses may be planted just as early as soil conditions will permit. Flowering shrubs which produce their flowers on new growth should be pruned if this has not already been done. This is the month for budding and grafting shrubs and trees. Planting and transplanting should be done now.

THE NORTH AND WEST

Refer to the suggestions made for the North and East.

Flower Garden:—Make cuttings of all plants to be propagated in this manner. Sow seeds of long season annuals in flats or in the open farther south. Transplant perennials. Start bulbs indoors.

Shrubs and Trees:—Roses may still be planted without a ball of earth on the roots. Prune winter-blooming shrubs immediately after they finish blooming. Prune poinsettias severely. Finish pruning shrubs which bear flowers on the new growth.

THE SOUTH

Evidences of the arrival of spring in the South are blooming snowdrops, scillas, muscari, crocuses, narcissi, early daffodils, and white and blue irises.

Vieing with these for brilliance of colors are pansies, violets, and phlox in scarlet, violet, salmon, yellow and white.

Flower Garden:—Plant corms of gladiolus every 10 days for succession of flowers, castor beans, marigolds, elephant ear, ricepaper plant, globe artichoke, and goldenrod. Divide and reset all kinds of perennials. It is seed sowing time in the South, hardy annuals in the upper South, half-hardy annuals in the middle South, and all annuals in the deep South.

Shrubs and Trees:—Prune broad-leaved evergreens. Cut back severely ligustrums and pittosporums. Dead wood should be cut out of all woody plants including the roses. Hybrid tea roses must be pruned carefully, while the polyanthus and floribunda roses should be cut back heavily. Yellow jasmine should be transplanted immediately after the flowering period. Transplant crepemyrtles and remember the more severely they are cut back the more profusely they will bloom.

Vegetable Garden:—Plant seeds of beans, onions, beets, peas, radishes, and others of similar requirements early in March. Later in the month may be planted the more tender vegetables, as sweet corns, cucumbers, squashes, and peppers. This is the month to transplant tomatoes and all other vegetables not yet set out in the fields for production. In the planting of vegetables, it is best to follow local practices so far as possible. Planting dates vary according to exposure, soil types, and elevations.

Wild Mint as Rat Chaser

Alexander Robertson writes to the Canada *Farmer*: "I have for the last four years proved to my satisfaction that the Wild Mint is a sure and reliable exterminator of rats. In proof of the fact, I will state the results it has had with me. Four years ago my barn was regularly infested with rats; they were so numerous that I had great fears of my whole grain being destroyed by them after it was housed; but having about two acres of wild mint that grew in a field of wheat, after the wheat was harvested, the mint was cut and bound with it, and it drove the rats from my premises. I have not been troubled with one since, nor am I at present, while my neighbors have any quantity of them. I feel confident that any person who is troubled with these pests could easily get rid of them by gathering a good supply of the Wild Mint and placing it around the walls or base of their barns."

On The Organic Front

By DR. WILLIAM H. EYSTER

DEAN of agriculture of the Kansas State College is the author of an article in the February, 1948 issue of *Country Gentleman* entitled "Fertilizers Go West." It is almost certain that the Joads will follow. The beginning of the Dean's article is illustrated with a wheat field having a curved strip of darker green plants caused by a "trial run" of 200 pounds of ammonium nitrate per acre. This a favorite stunt of the chemical fertilizer proponents, and a very striking one as well. Small quantities of most poisons when administered to man act as a stimulant, and it is only when the dose becomes large that the poisonous action is perceptible. This is a universal law and applies to all forms of life, including the soil bacteria. The addition of small amounts of alkali to the soil, for example, stimulate the activities and reproduction of bacteria. Some substances stimulate injurious bacteria, others stimulate the beneficial ones. Small amounts of the carbonates, chlorides, sulphates, and nitrates of sodium, calcium, magnesium, and ammonium increase greatly the activities of the soil bacteria. The increased bacterial activity may liberate more phosphorus and potassium for the plants. Dr. Joseph E. Greaves, Professor of Bacteriology, Utah State Agricultural College has the following to say about calcium sulphate often called gypsum or land plaster, "The dealer in gypsum often takes advantage of this fact in advertising his materials by writing the word PLASTER with a heavy application of the calcium sulphate in large letters on a cultivated field in view of the public road. In the larger greener growth of grain crops or grasses, the word PLASTER can be read by the passerby. In this way the farmers are induced to use gypsum or land plaster. This, however, is usually a stimulant, and if the landowner continues to apply the material year after year where the word was first written, the time will come when it cannot be read. If he continues the application long enough, ultimately one may read again the word PLASTER, but this time the grain composing the word will be inferior to that surrounding it, and the physical properties of the soil, where the plaster has been applied, will be found to be bad."[1]

What Professor Greaves tells us about the land on which gypsum is used will be the story of the soils in the eastern Great Plains States where artificial chemical fertilizers are being introduced. Those soils, once rich in organic matter, have been depleted by bad farming practices. The plant materials were not returned to the soil, and often were burned. With the humus level in the soil falling lower each year, the bacteria have insufficient food to convert and fix atmospheric nitrogen, and without nitrogen they are unable to make available the phosphorus and potassium. The addition to the soil of such artificial chemicals as ammonium sulphate is like a shot in the arm.

If you, farmers of the Great Plains States, follow the advice of our agricultural colleges in artificially stimulating the growth of your crops instead of following the law of Nature, your children will have to follow the Joads West.

1 Elementary Bacteriology by Joseph E. Greaves and Ethelyn O. Greaves, (W. B. Sanders Co., Philadelphia, 1946)

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O ALL YE GREEN THINGS by Martia Leonard. (Fox and Sutherland, Mt. Kisco, New York., 1947. $1.00).

The author gives her readers interesting historical, philosophical, and informational reading about plants and various kinds of gardens. This book is a real garden companion ready to enlighten the gardener on many garden details.

SUCCESSFUL HAMSTER RAISING by Al Hayner. (Hulva Lithographers, Inc., Peoria, Illinois., 1945. $1.50).

This 72-page booklet gives details of the raising of Hamsters for pets and for experimental animals in the biological laboratory.

GROUNDS FOR LIVING—The Home Dweller's Complete Guide to His Lawns, Trees, and Gardens by Richard B. Farnham and Van Wie Ingham. (Rutgers University Press, New Brunswick, New Jersey, 1946. $2.50).

This book is a complete guide, as the title indicates, for the man with a hoe and his lady with a gay new bonnet. It is a treatise on outdoor living for all the family, and makes the proper keeping of a beautiful home ground such a pleasant and satisfying experience. It is written especially for you, Mr. and Mrs. Gardener.

HARNESSING THE EARTHWORM by Thomas J. Barrett. (Bruce Humphries, Inc., Publishers, Boston, Mass., 1947. $2.50).

Although the earthworm is one of the most valuable animals of farm and garden as was pointed out long ago by Charles Darwin, little attention has been given to it until recently. Recent experiments have shown that it improves both the chemical and physical conditions of the soil. It literally eats its way through the soil making compost and aeration holes so that the soil is enriched and made more porous for the absorption of air and water. Dr. Barrett's book tells us all about the earthworm and its environment. It occurs in practically all parts of the world and greatly varies in size but always lives in the soil and helps to make it favorable for plant growth. Aristotle referred to earthworms as "the intestines of the earth." The author of this book shows us how the earth-

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by His Friends.

With the death of Sir Albert Howard, his quarterly *Soil and Health* is ceasing publication, by his own wish, and the work will be carried on by Newman Turner in *The Farmer*. Lady Howard has intimated this to all who are interested in the work of the great organic movement initiated by her late husband.

A cordial invitation is extended to all Sir Albert Howard's readers, contributors and correspondents, to maintain contact, exchange information and follow the progress of the pioneers through *The Farmer*.

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worm can be harnessed and put to work in the garden and on the farm. They are without doubt the most valuable livestock on the farm. Detailed methods of breeding and using earthworms to increase the fertility of the soil are given.

FLOWER ARRANGEMENT OF THE AMERICAS by Cora Maud Oneal. (Banks Upshaw and Company, Dallas, Texas, 1947. $5.00).

This well-written, beautifully illustrated book takes you south of the border and gives you an understanding of our neighbors as only flowers can. This book is worth reading not only because of the ingenious arrangements of tropical and semitropical plants, but because it represents a cultural approach to a better understanding of our neighbors in Mexico.

EDIBLE WILD PLANTS by Oliver Perry Medsger. (The Macmillan Company, New York, New York., 1947).

This is a book for all who love the woods and out-of-doors. The author introduces us to the wild edible plants as one who is on the most intimate terms with all our native plants. Hunting edible foods in the hedgerow and woods is as much fun as hunting game, and perhaps even more profitable. These foods are sources of minerals, vitamins, and other health-promoting substances which so often are deficient in our cultivated food plants.

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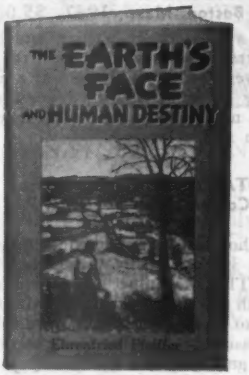

The Earth's Face and Human Destiny

by

EHRENFRIED PFEIFFER
M.D. (Hon.)

with a FOREWORD by
SIR JOHN STAPLEDON

MAN IS THE MEASURE OF ALL THINGS, responsible not only to himself as the measurer—but to that which he measures as well—to the landscape and environment in which he lives, for example.

The interaction of fire, air, water and earth, according to the ancient Greeks, determines the original and native character of a landscape—then man enters! Whether for weal or for woe he does change the face of that landscape. He sins against the biological laws that regulate its health, disturbing its delicate equilibrium and its natural rhythmic cycle of disease and renewal by ignorance of the ways in which to minister to its symptomatic ills. Devastating results accompanied him in his cultural trek through the ages. Leaving a wake of soil exhaustion behind him he has migrated across the globe from East to West. He is now at his Western terminus here in America. That last fertile remnant of the earth *must* be kept healthy if he is to support himself and nature in happiness, to say nothing of his current international duty to save large parts of the rest of the world from starvation and death.

A study of healthy and diseased landscape through all the phases of their improvement or deterioration is a necessary implement in the hands of the crusader for a regenerated natural health. Our age, though progressive in arts, science, industry and business, has been woefully remiss in its attention to the inexorable laws of nature. In wasting the natural resources of our planet it has been as wantonly destructive and prodigal with the precious health of the environment in which it must live as the Vandals scorching the earth with brutal stupidity as their only motive.

In this brilliant new book by an international authority of biodynamic agriculture we are shown step by step the ways in which we can achieve an ecological harmony between ourselves and the landscape in which we live. Dr. Pfeiffer warns us of the perils and pitfalls besetting the way to a healthy, biological world. With a fascinating style intelligible to even the dilettante and the layman and with a wealth of fine photographs illustrative of his points, he tells us that if we continue to upset natural balances our natural environment is doomed to decay and death and non-support of its population. Envlronmental landscape must be radiantly healthy and alive—or man himself is doomed. Discussing such important topics as the balance between industry and agriculture, between the urban and the rural, he shows us how seriously man has maladjusted the true essence of the natural landscape by decreasing its ordained diversification as he increases the range of his activities.

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ROSES OF THE WORLD IN COLOR by J. Horace McFarland. (Houghton Mifflin Company, Boston, Mass., 1947. $5.00).

This is a masterfully written and beautifully illustrated book on the rose, the queen of the flower garden. This book is a must in the library of everyone who loves the rose. There are nearly 300 pages of clear, concise description and colors.

BASIC BOTANY by Fred W. Emerson. (The Blakiston Company, Philadelphia, Pa., 1947, $4.00).

The author has presented the fundamental principles in an easily readable, logical manner. The first nine chapters are concerned with the biology of plants with special reference to seed plants. These are followed by a discussion of classification, genetics, and evolution and then the usual survey of the plant groups.

THE GARDEN NOTEBOOK

by Alfred Putz

In this book is given much expert advice on all the common garden problems. Precise information is given on starting seeds indoors, care of seedlings, requirements and care of all the common house plants, making a coldframe, planning for spring, how and when to sow all kinds of flower and vegetable seeds, care of the lawn, building and maintenance of rock gardens, planting of all kinds of bulbs, planting and care of roses, planting and pruning of shrubs and trees, care of hedges, preparing plants for winter, and many other similar aspects of gardening. The booklet contains about 30 full page illustrations to make clear details of garden techniques. This garden book is next best to having an expert gardener at hand when you want to ask questions on how to carry out specific procedures, as how to plant lilies in the fall, or how to start a lawn. . . . $1.25

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NATURE'S PLAN

October 20, 1947.

Organic gardening literally teaches working in harmony with God's plan. I have had little time to practice these miracles of nature, but on my retirement place in Michigan my summers have shown what organic gardening can do. The 12 year old apple tree that never had a bloom until this spring delighted me when it blossomed profusely following a rock and leaf mulch in the fall.

A pear and a Burbank plum set out in April in a previously dug hole filled with compost the fall before, both blossomed the same spring as planted.

I had tried red and black raspberries in rows (as advised by agriculture college), then changed to nature's way as told in O. G. I left the rows fill in producing a plant colony in the shade of trees. The results were astounding without the use of sprays and there was picking for 3½ weeks.

In my compost heap I have used Rhums phosphate rock, chicken manure, weeds, etc. very successfully.

T. J. Cutting,
3300 West Schubert Ave.,
Chicago 47, Ill.

—o—

COMPOST AS A UNIVERSAL FERTILIZER

October 15, 1947.

I have had wonderful success this past spring with tomatoes, cucumbers, squash, peas, beans, spinach and lettuce. Now I have a compost pile 30' x 6' x 5' of which I turned all but 6' last week. The steam from the heap has boiled out from the first day of making. I use turkey manure (fresh) with a little lime. At a time when I had no compost ready I put out some

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grape cuttings. After they were up about 12 inches I applied compost, and now with the lapse of six months they are higher than my head.

F. A. Fresman,
P. O. Box 961,
Laredo, Texas.

—o—

FLOWERS AND VEGETABLES ALL SEASON LONG

October 25, 1947.

I have always used your methods in my garden with my vegetables and flowers. Since flowers are my hobby, I have one of the most attractive flower gardens in the town. My snapdragons, dahlias, and zinnias are now blooming in profusion. I have flowers for the sick and shut-in, for my friends, and almost every Sabbath for my church. The soil for their culture is always prepared according to your suggestions. During the long hot summer when other folks had no tomatoes my vines continued to grow and bloom. The vines are still fresh and green and we still have tomatoes to share with our friends.

Charles O. Ransford,
Shelbina, Missouri.

—o—

DOUBLE ENDORSEMENT

November 17, 1947.

We highly commend Mrs. Lloyd Weber's endorsement of compost—even go her one better. Our grounds were bulldozed, so we dug holes and filled them with compost. In these compost-filled holes we set out in June small berry plants. For the past month we have been and still are picking berries from the plants that were set out in June. They are the Indian Summer (2-crop) variety, so we expect to get another crop next year from the same canes. The canes are not tall but are well branched and thrifty, with loads of fruit.

I. R. Winters,
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Farmers of Forty Centuries

or Permanent Agriculture in China, Korea, and Japan

by F. H. KING, D.Sc.,

formerly Professor of Agricultural Physics, University of Wisconsin; and Chief of Division of Soil Management, U. S. Dept. of Agriculture

COMPOST and compost only is the key to the problem of sustaining the fertility of the East—an East to which Western substitute principles of artificial chemical revivification of effete farm-lands has never penetrated. General and extensive everywhere throughout China and the Far East, compost fertilization is the salvation of a people who must fight for their very livelihood, wrench it from the pitiful pittance of arable land that is theirs.

Scientific husbandry of the type discussed so vividly and cogently by Dr. King must include, of course, not merely constant insemination of the soil, as with us, but, in a land where waste would mean race-suicide, complete use of all by-products as well. From the bounty of his soil the Chinaman returns to it all but the edible part of the crop reaped. His house refuse is destroyed by returning it to clean soil, where natural purification takes place.

Would it not be best for us too, in these years in which the virility of our own soil is being taxed to the uttermost to help in the adjustment of world-wide feeding problems, to make use of what is good in Chinese hygiene—a hygiene that *demands* respect, being, as it is, the product of an evolution extending from more than 1000 years before the Christian era?

Beautifully bound in Fabrikoid. 384 pages. 209 beautiful illustrations. $5.00.

The Earth's Green Carpet

by LOUISE E. HOWARD

THE author, wife of the late Sir Albert Howard, founder of the organic farming movement, is an authority on agricultural problems.

Are chemical fertilizers ruining our soil and our health? The answer, unfortunately, is yes. If you are contributing to medical funds for cancer, poliomyelitis, and heart disease you will be interested in a new theory that is sweeping America. We can prevent these degenerative diseases by seeing that no shot-in-the-arm chemical fertilizers are used in growing our food. Instead, the method of producing our crops by the use of organic fertilizers, made according to the method perfected by the late Sir Albert Howard, should be followed.

Man's health and happiness depends upon the use he makes of the Earth's Green Carpet. We must understand and adjust ourselves to Nature's processes as regards all forms of life, including soil organisms and those that commonly are regarded as pests. Diseases and pests are Nature's sure signs that not all is well with our culture. The Wheel of Life must be kept turning. Disease is but the beginning of Nature's composting. It is no enemy, but a natural function in Nature.

This is not a book filled with technical terms, it is vividly written. You can almost see the scramble for food and life amidst the myriads of soil bacteria. You see the plants jostling each other for a place in the sun, and above all you see nature trying to anchor and hold in its place the precious top layer of soil without which man would vanish from the surface of the earth.

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WOOD ASHES IN THE COMPOST HEAP

Q. Of what value are wood ashes in the compost heap?

L. F., Pigeon, Mich.

A. Wood ashes are a good source of potash and calcium and can be used in the compost heap instead of lime.

—o—

PHOSPHATE ROCK IN THE COMPOST HEAP

Q. I am preparing a compost heap and I am interested to know how to use phosphate rock in the compost heap. Can you advise me?

L. J. W., Schenectady, N. Y.

A. Mix the ground phosphate rock with an equal amount of ground limestone and apply them together as a sprinkling over each layer of the compost heap. Or sprinkle the lime and phosphate rock separately in alternate layers of the heap.

—o—

CORN COBS AS COMPOSTING MATERIALS

Q. A large supply of corn cobs are available and I am wondering if they can be made into compost. What plant nutrients do they contain?

H. H. L., Carrollton, Ill.

A. Corn cobs are excellent materials for composting. They should be put through a grinder or reduced to small pieces with any convenient tool

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Box O **Westminster, Md.**

before being put in the compost heap, so that decomposition will take place more rapidly. The finer plant materials are, the more rapidly they will be decomposed by the soil organisms. Each 100 pounds of corn cobs contain 0.4 pounds of nitrogen, 0.08 pounds of phosphorus, 0.55 pounds of potash, 0.02 pounds of calcium, 0.02 pounds of magnesium, and small amounts of a large number of trace elements. In composting corn cobs it is well to mix in the heap other plant materials to prevent the ground cob material from settling into compact layers.

—o—

THE WHEEL OF LIFE

Q. A farm owner states that for over thirty years he has never used commercial fertilizer on his farm and that production is the same today as the day he took the farm thirty years ago. He returns everything to the soil except the grain. The crop is harvested with a combine which collects the grain and returns the straw to the soil. He is using the organic method. Do you agree?

G. H. S., Brooklyn Park, Md.

A. This is an almost perfect example of the wheel of life as it is practiced in a forest. All of the organic matter, except the grains, is returned to the soil and converted by soil organisms into humus rich in plant nutrients. Evidently the deep-rooted crop plants, like alfalfa, take enough minerals from the subsoil to replace that removed in the wheat grains.

—o—

STRAWBERRY PLANTS WITHOUT BERRIES

Q. Last year my hybrid Kellog Special strawberries bore profusely. This

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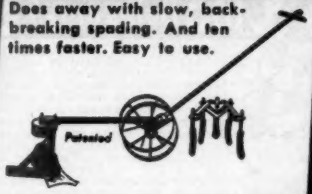

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Add 25c extra each bag West of Mississippi River

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REX. D. PEARCE

Dept. D, Moorestown, N. J.

year the plants are large and healthy and had loads of blossoms, but very few berries. This spring I had old manure and compost between the rows.

My neighbors to whom I gave runners had a bumper crop. One of them, a strawberry man, advised me to write to *Organic Gardening*.

Each year we dig in old manure and compost. The plants have shown no sign of disease on the leaves, but are extremely robust and healthy. What is the trouble?

Dr. W. N. P., Washington.

A. Spring set strawberry plants produce their maximum yield the first year after setting. Normally they bear fewer and smaller berries each subsequent year. Because of this, beds are fruited only once or twice then dug up immediately after the berries have been harvested. Your strawberry bed is probably too old to bear any kind of a crop. Your neighbors have, as you say, a bumper crop but with your

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compost-enriched soil you doubtless would have had even a larger crop than your neighbors if you had planted a young patch. The disease-free and robust condition of your plants are the results of your organic fertilizers. To get the best results, do not keep a strawberry patch longer than two years. Some growers plant a new patch each year.

—o—

KELPS FOR COMPOSTING

Q. Can the kelps (brown algae which live in the sea) be used in the compost heap?

L. H. E., Muskegon, Mich.

A. The kelps are excellent composting materials and are a good source of potash and iodine. The potash content of kelps, according to the species, varies from one to five per cent. The giant kelp, *Macrocystis pyrifera*, is a perennial which can be harvested several times annually. The potash content of the dry tissue is about 1.5 per cent. Kelps also contain iodine in sufficient amounts to meet the needs of plants.

—o—

CONTROL OF LEAF MINER AND TARNISHED BUG

Q. How can we control leaf miner and tarnished plant bug in chrysanthemums?

J. A. P., Vancouver, B. C.

A. The leaf miner and tarnished bug can be controlled fairly well by practicing plant sanitation. Be sure that all plant materials and other objects under which these insects hide

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B—M PLANT PRODUCTS, Bridgeton 14, Indiana

ACTIVO Compost and Soil Activator

and hibernate during the winter are cleaned up and placed in the compost heap.

—o—

NATURAL PHOSPHATE ROCK

Q. I was told by a local seed company that rock phosphate is no good and that only superphosphate has any value. What is your opinion on this?

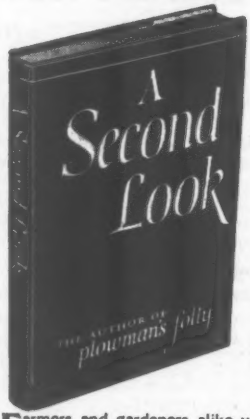
G. H. C., Newton Centre, Mass.

A. Superphosphate is rock phosphate which has been treated with sulphuric acid. It is highly soluble and is absorbed by plants in such amounts as to intoxicate them. It is like a shot in the arm. It is like a distilled liquor and has the same effect on plants as such liquors have on man. Untreated rock phosphate is insoluble when applied to the soil, but becomes soluble under the influence of organic acids in the soil at just the rate necessary to give to the plants a moderate but continuous supply of phosphorus. Also the superphosphates add sulphuric

A SECOND LOOK

By The Author Of

PLOWMAN'S FOLLY



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•

ORGANIC GARDENING
DEPT. OKLA.—5 EMMAUS, PA.

acid to the soil which tends to make it so acid that the soil bacteria cannot survive.

—o—

TOMATO PLANTS FOR COMPOSTING

Q. This year we had 1½ acres of tomato plants. Can the plants be incorporated in the compost heap without danger of transferring tomato blight to the soil with the compost next year?

H. L. T., Davenport, Iowa.

A. Old tomato plants can be used for making compost to be used for fertilizing tomato plants next year without danger of blight or any other disease next year from the compost. This is true if the compost heap is properly constructed so that the heat of fermentation kills all diseases and insect pests. Old tomato vines add to the compost heap exactly what growing tomato plants need for good growth.

—o—

GLADIOLUSES AND CHRYSANTHEMUMS

Q. Will you please tell me how to prepare the soil for gladioluses and chrysanthemums? I have some

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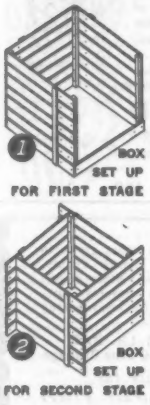

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HOW TO USE

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Box 29, Mahopac, N. Y.

ground that has not been used for about twelve years and would like to use it for "glads" and "mums" next year, and would like to know how to go about getting it ready for them.

E. S., Frenso, Calif.

A. In the fall, not later than October, the soil in which the gladioli are to be planted should be spaded quite deeply and have incorporated with it a liberal amount of compost. During the winter months when sufficiently dry, the soil should be turned over lightly several times. By the first week in March the ground usually is in good condition to plant out the first lot of corms. You can have a succession of blooms during the entire season by planting at intervals of two or three weeks. The corms should be planted from 6 to 12 inches deep to insure the plant against falling over at the time of flowering. Organic fertilizers should be used to get the best results. Properly made compost is best of all.

Chrysanthemums do best when planted in a mixture of three parts

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LARGE, WHITE, WAXY TRUMPETS

BULBLETS, pound (about 65) prepaid.....$3.00

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CHAS. V. LEAMAN HYBRIDIZER

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good fibrous loam and one part compost with a sprinkling of bone meal. If the loam is heavy it will help to work some sand into the soil mixture. In planting chrysanthemums, watering is of the greatest importance.

—o—

CONTROL BLACK ROT

Q. We have a ten acre grape vineyard located about three miles south of Lake Erie in North Olmsted. We have a very serious Black Rot condition and also grape berry moth, which has given us some terrific losses in the past few years. I am using 3% DDT in dust form which we put on with a powder duster when the grapes are full of the morning dew. I am quite concerned over the failure of this dust to stop the bad condition and would be anxious for an immediate reply on something which you think will help rectify this condition. I have had some success with the use of manure in checking this.

I also would like to have your opinion on the following procedure:

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Learn the real JOY of organic gardening. Make richest humus cheaply, in 2 to 6 weeks, from all sorts of vegetable and animal waste—without odor.

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ORGANIC GARDENS
Perry Hall Fullerton P. O., Md.

I plan to stop cultivation in the vineyard completely and mulch under the trellis and grow rye in the centers. Planning to cut the rye and use it under the trellis for the mulch. What do you think of this plan? I have a tractor and disc. The grape roots have come up closer to the surface to get the manure and when I use the disc, I am cutting off all the small feeder roots.

Please make an immediate reply if you possibly can concerning the question. Am I doing the soil any great harm in the use of DDT. I use about one ton of dust yearly.

We read your organic magazine over and over. Keep up the good work. I use your method of composting in the garden but ten acres has me stumped right now.

R. F. P., North Olmsted, Ohio.

A. Black rot is the most destructive fungous disease of the grape. It lives over winter in shriveled, mummied, rotted fruit, and puts out a crop of spores which germinate in the spring and infect the new growth of the vines. The first control measure

TABLELAND EARTHWORM HATCHERY
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is to destroy or remove all diseased fruits when the vines are cleaned in the fall. Next most important step is early-spring cultivation so that any spores that may be present on the surface of the soil will be cultivated under. Cultivation should be frequent. These measures, which might be regarded as sanitary measures, will go a long way to reduce the amount of infection. To completely eliminate black rot, however, the soil must be so rich in humus that it will support a rich population of soil organisms, bacteria, fungi, earthworms. When these organisms are present in such large numbers that your soil is really "living," you will no longer be pestered with black rot of grape. I would suggest also that you discontinue the use of all poisons because they inevitably drain to the ground and kill the organisms in the soil.

Your plan to grow rye as a source of mulch and finally humus is excellent. I would suggest also that you use compost rather than fresh manure to fertilize the vines. The compost should be made as outlined in *Organic Gardening Magazine* numbers and in our leaflet "Compost—How To Make It."

My suggestions will help very little your present crop, but will surely give you disease-free vines in the years to come.

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Permanent Soil Conditioner
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J. K., Long Island.

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—o—

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J. K., New York

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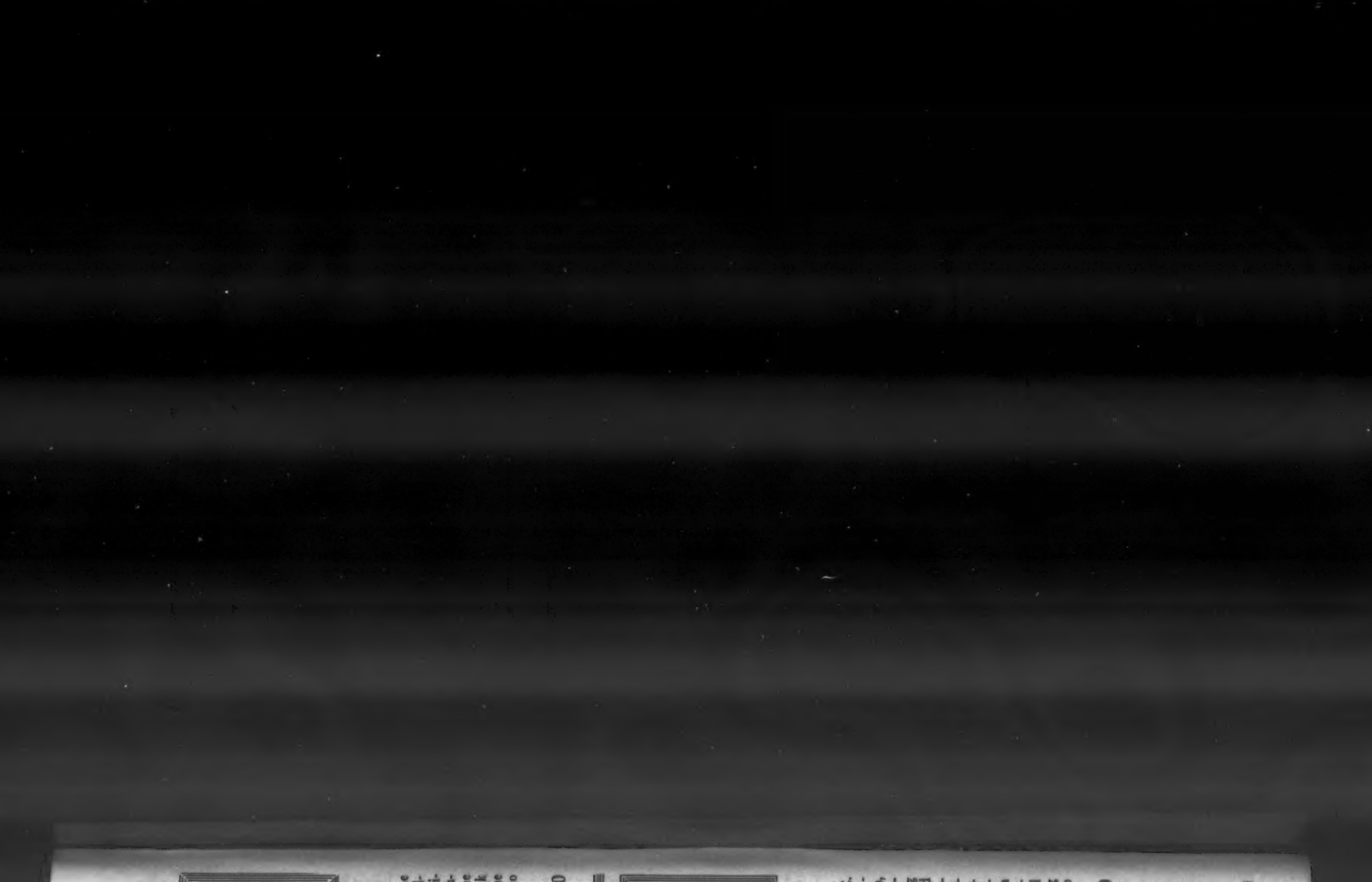

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